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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/729,574
Filing Date: December 04, 2003
Appellant(s): ANDERSON, THOMAS G.

V. Gerald Grafe
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed January 1, 2006 appealing from the Office action mailed May 20, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is deficient. 37 CFR 41.37(c)(1)(v) requires the summary of claimed subject matter to include: (1) a concise explanation of the subject matter defined in each of the independent claims involved in the

appeal, referring to the specification by page and line number, and to the drawing, if any, by reference characters and (2) for each independent claim involved in the appeal and for each dependent claim argued separately, every means plus function and step plus function as permitted by 35 U.S.C. 112, sixth paragraph, must be identified and the structure, material, or acts described in the specification as corresponding to each claimed function must be set forth with reference to the specification by page and line number, and to the drawing, if any, by reference characters. The brief is deficient because the summaries for claims 21 and 22 comprise references, by page and line number, to the specification. However the specification, at the cited page and line numbers, fails to explicitly describe the limitations of claims 21 and 22.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,219,032	ROSENBERG et al.	4-2001
6,801,187	STEWART et al.	10-2004
5,655,093	FRID-NIELSON	8-1997

6,191,785	BERTRAM et al.	2-2001
6,288,705	ROSENBERG et al.	9-2001
6,583,782	GOULD et al.	6-2003
6,552,722	SHIH et al.	4-2003
6,220,963	MEREDITH	4-2001
6,277,030	BAYNTON et al.	8-2001

(9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

A. Claims 3-4, 7-8, 11-13, 19-24, 26-29, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,219,032, which is attributed to Rosenberg et al. (and hereafter referred to as "Rosenberg"). In general, Rosenberg presents a human/computer interface device in conjunction with a graphical user interface, whereby the interface device is used to affect the motion of a cursor, and other objects, which are displayed in the graphical user interface. Force feedback is provided to the interface device in order to inform the user of graphical objects encountered by the cursor (see column 2, line 53 – column 3, line 6). Consequently, Rosenberg is considered to teach a method, implemented within a human-computer interface, for allowing a user of a haptic input device to affect the motion of an object in a computer application.

Specifically regarding claim 3, Rosenberg describes a particular type of force feedback applied to the interface device, namely a "groove" force. According to Rosenberg, this groove force provides a detent sensation along a line – to make the interface device feel like it is captured in a groove (see column 38, line 38 – column 39, line 9). While the interface device moves along this groove, no force is applied to the device. However, if the interface device attempts to move out of the groove, a force is applied resisting the device's movement out of the groove (see column 38, line 38 – column 9, line 39). Rosenberg discloses that a groove force can be applied to a cursor, such that when the cursor is moved into a groove, resistive forces are applied to resist movement out of the groove, but freely allow movement along the length of the groove (see column 57, line 30 – column 58, line 8). This groove force is considered applicable to other user interface objects, as well as a cursor. For example, a groove force may also be applied to a scroll bar or slider "thumb" such that the user is freely able to drag the thumb along the length of the scroll bar, but movement out of the scroll bar is resisted (see column 59, line 49 – column 60, line 39). Consequently, a groove is considered an "object fundamental path," like that of the claimed invention, as it represents a path of motion of an object in a computer application. Since the position of the interface device corresponds to the position of the object (see column 2, line 67 – column 3, line 7), Rosenberg is also considered to teach establishing a device fundamental path, representing a path of the interface device, and corresponding to the groove. The object, such as a cursor or scroll bar thumb, is moved along the groove in response to a component of input device motion along the device fundamental path, and a resistive force is applied to the interface device in response to a component of input device motion not along the device fundamental path. Additional forces may be applied to the interface device in response to

interaction of the object, i.e. the cursor or scroll bar thumb, with the application (for example, see column 44, line 65 – column 45, line 21). For example, within a scroll bar associated with a groove force, it is understood that "collision" forces may additionally be applied (i.e. at the top and bottom of the scroll bar) when dragging the scroll bar thumb (see column 59, line 49 – column 60, line 45). Such collision forces may also be applied to the cursor by itself, for example, in response to crossing window boundaries (see column 60, lines 46-62). This force feedback described by Rosenberg may be applied within various types of applications, such as an operating system (for example, see column 6, lines 55-65). Accordingly, Rosenberg is considered to teach: establishing an object fundamental path, i.e. a groove, representing a path of motion of an object, e.g. a cursor, in a computer application, e.g. an operating system; establishing a device fundamental path in correspondence with the object fundamental path; detecting motion of a haptic input device; moving the object in the computer application along the object fundamental path responsive to a component of haptic input device motion along the device fundamental path; applying a force to the haptic input device responsive to a component of haptic input device motion not along the device fundamental path; and applying a force to the haptic input device responsive to interaction of the object with the application. Rosenberg thus teaches a method like that of claim 3, which is for allowing a user of a haptic input device to affect the motion of an object in a computer application.

In reference to claim 4, Rosenberg teaches applying forces to the interface device corresponding to the motion of the object in an application, wherein the forces provide a perception of momentum and inertia of the input device corresponding to the momentum and inertia of the object. For example, Rosenberg discloses that the above-described thumb may

have a simulated mass, such that the user feels the inertia of the thumb when dragging it with a cursor (see column 59, line 49 – column 60, line 29). Rosenberg similarly discloses that the cursor itself may have a simulated mass, which may be used to apply appropriate force feedback to the interface device in response to interaction of the cursor with objects within the graphical user interface (see column 60, lines 46-62).

In regard to claim 7, Rosenberg teaches that a cursor may interact with an application, wherein the interaction of the cursor with the application is dependent on the speed of the cursor (for example, see column 60, lines 30-62). It is therefore understood that a cursor may interact with the application, dependent upon the speed of the cursor, particularly as the cursor moves along a groove.

Referring to claim 8, Rosenberg teaches displaying a visual representation of a cursor, i.e. object, to the user, particularly within a graphical user interface (for example, see column 2, line 60 – column 3, line 11).

With respect to claim 11, the cursor of Rosenberg is considered to comprise two representations: a visual representation that is used in a display to provide visual feedback to the user (for example, see column 2, line 60 – column 3, line 3), and an interaction representation that is used with the interface device to provide force feedback to the user (for example, see column 60, lines 30-62).

Concerning claim 12, Rosenberg describes a groove, such that if an interface device attempts to move out of a device fundamental path corresponding to the groove, a force is applied resisting the device's movement, as is described above. This force has a first magnitude for a first position of the interface device a first distance from the device fundamental path, and a

second, larger magnitude for a second position of the interface device a second, larger distance from the device fundamental path (see figure 15, in addition to its description in column 38, line 38 – column 39, line 9).

Regarding claim 13, Rosenberg teaches applying a "capture" or "barrier" force along a device fundamental path corresponding to a groove, wherein the force apposes motion of an interface device beyond an end of the device fundamental path (for example, see figure 21, and its corresponding description in column 59, line 65 – column 60, line 8).

Regarding claims 19 and 20, Rosenberg describes a groove, such that if an interface device attempts to move out of a device fundamental path corresponding to the groove, a force is applied resisting the device's movement, as is described above. In other words, Rosenberg teaches that the force resists motion of the interface device off the device fundamental path along a first dimension. Additionally, Rosenberg teaches that a characteristic of an object in the application may be responsive to motion of the interface device off the device fundamental path along a second dimension, different from the first dimension. For example, a "command gesture" may be applied to the object in response to movement of the interface device along this second dimension (see column 45, line 61 – column 46, line 19).

Regarding claims 21 and 22, Rosenberg describes a groove, such that if an interface device attempts to move out of a device fundamental path corresponding to the groove, a force is applied resisting the device's movement, as is described above. Additionally, Rosenberg discloses that a force may be applied to the interface device in response to the position of the cursor along the groove (for example, see column 60, lines 2-23), and in response to the interaction of the cursor with the application (for example, column 60, lines 24-62). The

magnitude of the force applied to the interface device is thus partially dependent on the position of the cursor along the groove, i.e. object fundamental path, and partially dependent on the interaction of the cursor with the application.

Concerning claims 23 and 24, Rosenberg discloses that the magnitude of the force resisting the interface device's motion off of the device fundamental path is partially dependent on a parameter of the interface, namely a "magnitude parameter" (for example, see column 38, lines 38-53). As a major goal of such force feedback is to assist the user in targeting graphical user interface objects (see column 44, lines 50-64), this magnitude parameter is considered a "user-assistance parameter," like recited in claim 23. Additionally, Rosenberg discloses that the user may adjust such parameters to suit his or her needs (for example, see column 52, lines 54-59). The magnitude parameter may thus be established by a measure of the user's proficiency in manipulating the interface device.

With respect to claims 26, 28, and 29, Rosenberg discloses that a groove force may be an internal force, meaning that it is established once the user positions a cursor within a region associated with the groove (see column 3, lines 37-49; and see column 59, line 49 – column 60, line 13). Rosenberg thus teaches determining when the user establishes a motion-initiation signal, specifically by determining when the user positions a cursor within a region associated with a groove. The positioning of the cursor within the region associated with the groove is understood to comprise a switch actuated by the user. For example, the input device itself may comprise a switch to detect its movement and position, or, software implementing the method of Rosenberg may comprise some sort of switch construct to determine output force in response to the position of the cursor. In response to detecting the motion initiation signal, an object

fundamental path i.e. a groove, is established. As this groove is associated with a corresponding device fundamental path, it is understood that a device fundamental path is additionally established according to a defined path, namely this groove, and a position of the cursor when the motion-initiation signal was supplied.

Concerning claims 27 and 30, Rosenberg teaches determining when the user establishes a motion-initiation signal, specifically by determining when the user positions a cursor within a region associated with a groove, as is described in the previous paragraph. The motion-initiation signal thus comprises motion of the cursor to a defined range of the cursor's motion, or in other words, motion of the input device having defined characteristics.

B. Claims 3, 5, 6, 35, and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,801,187, which is attributed to Stewart et al. (and hereafter referred to as "Stewart"). In general, Stewart describes a haptic interface for reviewing and manipulating a geometric model, for example, as found in a CAD application (see column 1, line 15 – column 2, line 62). Stewart particularly teaches establishing and displaying on a display system the geometric model, in addition to a visual representation of the user's haptic input device (see column 5, lines44-61; and figure 3). This geometric model, as displayed on the display system, is considered an object fundamental path since it designates a path that the visual representation of the input device follows in order to "feel" the geometric object represented by the model. Additionally, Stewart discloses that a "virtual surface" is established, which corresponds to the geometric model, and represents the path the input device must follow in order to "feel" the geometric model (see figure 3; in addition to column 4, line 21 – column 6, line 12). Such a

virtual surface is therefore considered a device fundamental path. Stewart discloses that a force is applied to the haptic input device in order to constrain the user's hand onto the virtual surface (for example, see column 4, line 41 – column 6, line 38). Accordingly, Stewart is considered to teach moving the visual representation of the input device in the computer application along the object fundamental path responsive to a component of haptic input device motion along the device fundamental path, and applying a force to the haptic input device responsive to a component of haptic input device motion not along the device fundamental path. As stated above, Stewart also teaches that the user, via the haptic input device, may modify the geometric model (for example, see column 7, lines 13-38). It is understood that in doing so, force feedback is applied to the haptic input device (see e.g. column 6, lines 20-38), and thus, a force is applied to the haptic input device responsive to interaction of the object with other objects in the application. Moreover, since the geometric model is modified by the user's edits, the object and device fundamental paths representing this model, it is understood that the shape of the object fundamental path and the device fundamental path is similarly modified. Stewart thus teaches that the application may comprise a plurality of states, each being associated with particular user edits of the geometric model, and wherein the shape of the object fundamental path and the device fundamental path is dependent on the state of the application.

Claim Rejections - 35 USC § 103

C. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over the U.S. Patent of Rosenberg, which is described above, and also over U.S. Patent No. 5,655,093, which is

attributed to Frid-Nielson. As shown above, Rosenberg teaches a method like that recited in claim 8, wherein particularly, an object fundamental path, namely a groove, is established to represent a path of motion of an object in a computer application, and a corresponding device fundamental path is established to represent a path an interface device must take in order to move the object along the object device fundamental path. This object may be, for instance, a cursor displayed within a graphical user interface, and the object fundamental path may be defined by a groove applied to a scroll bar, such that the user is freely able to move the cursor along the length of the scroll bar, but movement out of the scroll bar is resisted (see column 59, line 49 – column 50, line 39). As the device fundamental path represents a path the interface device must take in order to move the cursor along the groove – the scroll bar in this case – it is understood that when the device is not on the device fundamental path, the cursor is not within the bounds of the scroll bar. Rosenberg, however, does not explicitly disclose that the cursor on the scroll bar is perceptively different from the cursor off the scroll bar, or in other words, that the cursor when the device is on the device fundamental path is perceptively different from the cursor when the device is not on the device fundamental path, as is expressed in claim 9.

Like Rosenberg, which teaches providing force feedback in response to graphical objects encountered by the cursor, Frid-Nielsen teaches providing feedback to the user in response to graphical objects encountered by the cursor. Frid-Nielsen particularly teaches adjusting the depiction of the cursor to provide information about which user inputs are available on the objects encountered by the cursor. For example, and regarding the claimed invention, Frid-Nielsen discloses that the appearance of the cursor may be altered when it is placed on a scroll

bar, the altered appearance indicating valid inputs of the user interface device (See column 8, lines 29-48).

Therefore, it would have been obvious to one of ordinary skill in the art, having the teachings of Rosenberg and Frid-Nielson before him at the time the invention was made, to modify the cursor of Frid-Nielsen, such that it changes its appearance when placed on a scroll bar, or in other words, such that the cursor when the device is on the device fundamental path is perceptively different from the cursor when the device is not on the device fundamental path. It would have been advantageous to one of ordinary skill to utilize such a combination because such a modifiable cursor image provides information about system commands to the user, thus creating a more intuitive user interface, as is taught by Frid-Nielsen (see column 3, lines 31-39).

D. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the U.S. Patent of Rosenberg, which is described above, and also over U.S. Patent No. 6,191,785, which is attributed to Bertram et al. (and hereafter referred to as "Bertram"). As described above, Rosenberg teaches a method like that described in claim 3, whereby the method may particularly be applied to a scroll bar to comprise: establishing an object fundamental path, i.e. a groove, representing the path of motion of a scroll bar "thumb;" establishing a device fundamental path in correspondence with the groove; detecting motion of an interface device; moving the thumb in the computer application along the groove responsive to a component of interface device motion along the device fundamental path; and applying a force to the input device responsive to a component of interface device motion not along the device fundamental path, and responsive to

interaction of the thumb with the application. Rosenberg, however, does not explicitly disclose that additional object fundamental paths may be established, as is expressed in claim 10.

Like Rosenberg, Bertram discusses scroll bars (for example, see column 1, line 19 – column 2, line 13). Regarding the claimed invention, Bertram teaches that a graphical user interface may comprise a plurality of scroll bars, each having a thumb (for example, see the scroll bars represented by reference numbers 64 and 70 in figure 3).

Therefore, it would have been obvious to one of ordinary skill in the art, having the teachings of Rosenberg and Bertram before him at the time the invention was made, to modify the interface by Rosenberg to include a plurality of scroll bars, as done by Bertram. It would have been advantageous to one of ordinary skill to utilize such a combination because a plurality of scroll bars allow the user to scroll the display in more than one dimension, such as for example, they allow the user to scroll both horizontally and vertically, as is demonstrated by Bertram. Thus with the method of Rosenberg applied to a plurality of scroll bars, each scroll bar having a "groove" associated therewith, a second object fundamental path, i.e. groove, representing the path of motion of a second thumb is established; a second device fundamental path in correspondence with the second groove is established; it is determined if either fundamental path is active, or in other words, if the user has selected one of the thumbs using a cursor; the selected thumb is moved along its associated groove responsive to a component of interface device motion along the active device fundamental path; and a force is applied to the interface device responsive to a component of interface device motion not along the active device fundamental path.

E. Claims 14 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the U.S. Patent of Rosenberg, which is described above, and also over U.S. Patent No. 6,288,705, which is attributed to Rosenberg et al. (and hereafter referred to as "Rosenberg II"). Regarding claim 14, Rosenberg teaches a method for allowing a user of a haptic input device to affect the motion of an object in a computer application, whereas described above the method comprises: establishing an object fundamental path representing a math of motion of the object in the computer application; establishing a device fundamental path in correspondence with the object fundamental path; detecting a motion of the haptic input device; moving the object in the computer application along the object fundamental path responsive to a component of haptic input device motion along the device fundamental path; and applying a force to the haptic input device responsive to a component of haptic input device motion not along the device fundamental path. Rosenberg, however, does not explicitly teach applying a force to the haptic input device to urge the haptic input device to a starting region of the range of motion of the haptic input device, whereas recited in claim 14, the starting region comprises a region of the range of motion of the haptic input device such that motion of the haptic input device along the device fundamental path starting the in starting region will not require motion of the haptic input device outside its range of motion.

Like Rosenberg, Rosenberg II similarly describes a haptic user interface (for example, see column 5, line 56 – column 6, line 9). Rosenberg II particularly notes that in such haptic interfaces, various points on the display may become unreachable via the range of motion of the haptic input device (for example, see column 4, lines 37-64; and column 29, line 31 – column 30, line 14). Rosenberg II alleviates this problem via various embodiments, each applying a force to

the haptic input device, either automatically or by the user, to urge the haptic input device towards a particular region of the range of motion of the haptic input device, such that movement of the haptic input device starting in this particular region will not require movement of the haptic input device outside its range of motion (for example, see column 30, line 47 – column 32, line 43; and column 37, lines 44-61). Such a particular region is considered a "starting region," like that recited in claim 14.

Consequently, it would have been obvious to one of ordinary skill in the art, having the teachings of Rosenberg and Rosenberg II before him at the time the invention was made, to modify the haptic interface taught by Rosenberg, such that forces may be applied to the haptic input device to prevent it from reaching the limits of its range of motion, as is taught by Rosenberg II and described above. It would have been advantageous to one of ordinary skill to utilize this combination because if the input device reaches its limits, it reduces the realism provided by the force feedback, as is taught by Rosenberg II (for example, see column 4, lines 37-64).

In reference to claim 25, Rosenberg teaches defining a motion-initiation region, namely a "force field," which comprises a portion of the interface device range of motion (see column 40, lines 21-41). In response to determining that the input device is within this force field, an "attractive" force may be applied to the device urging it to a device fundamental path corresponding to a groove (see column 59, lines 49-63).

F. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over the U.S. Patent of Rosenberg, which is described above, and also over U.S. Patent No. 6,583,782, which is

attributed to Gould et al. (and hereafter referred to as "Gould"). As shown above, Rosenberg teaches a method like that recited in claim 3, wherein particularly, an object fundamental path, namely a groove, is established to represent a path of motion of an object in a computer application, and a corresponding device fundamental path is established to represent a path an interface device must take in order to move the object along the object device fundamental path. This object may be, for instance, a cursor displayed within a graphical user interface. Rosenberg, however, does not explicitly disclose that the device fundamental path has a different shape than the object fundamental path, as is recited in claim 15.

Like Rosenberg, wherein force feedback is provided to the interface device in response to graphical objects encountered by the cursor, Gould teaches providing "virtual force feedback" to the user in response to graphical objects encountered by the cursor (for example, see column 6, lines 42-62). Such virtual force feedback is applied by affecting the movement of the cursor, relative to the movement of the interface device (see column 8, lines 31-42). For example, Gould discloses that such virtual force feedback can be applied to a thumb or an elliptical selector wheel displayed within a graphical user interface (See column 16, lines 5-24). Virtual force feedback, similar to the groove force described by Rosenberg, may be applied to keep the cursor on the wheel. However in the case of virtual force feedback, the user does not have to move the input device in the exact circular shape of the wheel in order to keep the cursor on the wheel – the cursor is maintained on the wheel in response to attractive and repelling virtual forces provided by the wheel. Thus regarding the claimed invention, Gould teaches that the path in which the cursor moves on the screen, i.e. the object fundamental path, may have a different

shape than the path in which the interface device moves, i.e. the device fundamental path (for example, see figure 10A, and its corresponding description in column 16, lines 48-60).

Therefore, it would have been obvious to one of ordinary skill in the art, having the teachings of Rosenberg and Gould before him at the time the invention was made, to modify the graphical user interface taught by Rosenberg to include virtual force feedback, or in other words, such that the device fundamental path does not have to be the same shape as the object fundamental path, as is taught by Gould. It would have been advantageous to one of ordinary skill to utilize such a combination because such virtual force feedback reduces "background mechanical noise" as is taught by Gould (see column 6, line 63 – column 7, line 3). Background mechanical noise may reduce productivity, even with force feedback devices like that of Rosenberg (see column 2, lines 4-9; and column 1, lines 31-41 of Gould).

G. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Rosenberg and Gould, which is described above, and also over U.S. Patent No. 6,552,722, which is attributed to Shih et al. (and hereafter referred to as "Shih"). As described above, Rosenberg and Gould teaches a method like that described in claim 15, whereby a device fundamental path is established, in correspondence with a defined "groove," to represent a path of movement of an interface device. While Rosenberg discloses that the groove, and consequently the corresponding device fundamental path, may be defined along a given degree of freedom of the interface device (see, for example, column 32, lines 44-55; and column 38, lines 38-51), neither Rosenberg nor Gould explicitly disclose that the device fundamental path

defines a curve in three-dimensions, a curve in two-dimensions, or a surface in three-dimensions, as is recited in claims 16-18, respectively.

Like Rosenberg, Shih teaches establishing an object fundamental path, which is defined by a "geometric constraint," and which represents a path of motion of a "virtual tool" object in a user interface (see the abstract of Shih). As a haptic interface device is used to affect the motion of the virtual tool in the interface (see the abstract of Shih), a corresponding device fundamental path representing the path of motion required by the interface device to move the virtual tool along the object fundamental path is considered to be likewise established. As also done by Rosenberg, a force is applied to the interface device of Shih responsive to a component of input device motion not along this device fundamental path (for example, see column 37, line 41 – column 38, line 11). Regarding the claimed invention, Shih teaches that the object fundamental path, and consequently its corresponding device fundamental path, as defined by a geometric constraint, may define a point, line, curve, surface, or space representation, understood to be within two- or three- dimensions (for example, see column 37, lines 15-40; and column 8, line 21 – column 8, line 23).

It would have therefore been obvious to one of ordinary skill in the art, having the teachings of Rosenberg, Gould, and Shih before him at the time the invention was made, to modify the device fundamental path taught by Rosenberg and Gould such that it defines a curve in three-dimensions, defines a curve in two-dimensions, or defines a surface in three-dimensions, as is done by Shih. It would have been advantageous to one of ordinary skill to utilize such a combination because such device fundamental paths are applicable in a plurality of applications, specifically CAD applications, as is taught by Shih (for example, see column 1, line 61 – column

2, line 9). Modifying Rosenberg and Gould by Shih would thus create a more general, and more useful, technique for providing feedback.

H. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Rosenberg and Gould, which is described above, and also over Rosenberg II, which is additionally described above. As described above, Rosenberg and Gould teach a method like that of claim 15, whereby a device fundamental path and an object fundamental path, representing the path of an input device and a corresponding display object, respectively, may have different shapes. Neither Rosenberg nor Gould, however, explicitly disclose that the correspondence between the device fundamental path and the object fundamental path is not one to one, as is recited in claim 34.

Like Rosenberg and Gould, Rosenberg II describes a device fundamental path and an object fundamental path, representing the path of an input device and a corresponding display object, respectively. Regarding the claimed invention, Rosenberg II discloses that the device fundamental path and the object fundamental path may comprise different shapes (for example, see column 26, lines 9-41), and that the correspondence there between may not be one to one (for example, see column 18, line 60 – column 19, line 17).

It would have therefore been obvious to one of ordinary skill in the art, having the teachings of Rosenberg, Gould, and Rosenberg II before him at the time the invention was made, to modify the correspondence between the device fundamental path and the object fundamental path, as is done by Rosenberg II. It would have been advantageous to one of ordinary skill to utilize this combination because, not having a one to one correspondence between the device

fundamental path and the object fundamental path can compensate for differences in size between the display space and the range of movement of the input device, as is taught by Rosenberg (for example, see column 18, line 60 – column 19, line 17).

I. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,220,963, which is attributed to Meredith, and also over the U.S. Patent of Rosenberg, which is described above. In general, Meredith describes a computerized pool cue input device for use with computer-simulated games of pool (see column 2, lines 6-13). The movement of this input device results in corresponding movement of a displayed object, namely the tip of a cue stick, on a computer display (see column 5, lines 16-30). Thus regarding claim 32, Meredith discloses: a computer application which comprises a pool simulation; an object in the in the computer application, wherein the object comprises a pool cue; an object fundamental path representing a path of motion in the computer application, wherein the object fundamental path comprises a path suited for perception of the motion of a pool cue. In response to detecting the motion of the input device, i.e. computerized pool cue, the object in the application is moved along the object fundamental path responsive to a component of input device motion along the device fundamental path. Meredith, however, does not explicitly teach establishing an object fundamental path and a device fundamental path, such that a force is applied to the input device responsive to a component of input device motion not along the device fundamental path, as is recited in claim 3, upon which claim 32 depends.

As described above, Rosenberg teaches establishing an object fundamental path, namely a groove, and a corresponding device fundamental path, such that an object in an application is

moved along the object fundamental path responsive to a component of input device motion along the device fundamental path, and such that a force is applied to the input device responsive to a component of input device motion not along the device fundamental path. Moreover, Rosenberg teaches that such a force may be applied to a computerized pool cue input device (for example, see column 13, line 65 – column 14, line 9).

Consequently, it would have been obvious to one of ordinary skill in the art, having the teachings of Meredith and Rosenberg before him at the time the invention was made, to modify the input device and simulation taught by Meredith such that force feedback is applied to the input device response to input device motion not along an established device fundamental path, as is done by Rosenberg. It would have been advantageous to one of ordinary skill to utilize such a combination because such force feedback can reduce the difficulty of required "targeting" tasks, thus facilitating interaction with the computer application, particularly for users having dexterity-debilitating conditions, as is taught by Rosenberg (for example, see column 44, lines 50-64).

J. Claims 31 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,277,030, which is attributed to Baynton et al. (and hereafter referred to as "Baynton"), and also over the combination of Rosenberg and Meredith, which is described above. In general, Baynton describes a computerized golf swing apparatus, which provides force feedback to correct a user's golf swing (for example, see the abstract). Baynton more specifically teaches: establishing a device fundamental path, namely a predetermined golf swing path; detecting motion of an input device; and applying force to the input device responsive to a

component of the input device motion not along the device fundamental path (see column 3, lines 17-52). However, Baynton does not explicitly teach implementing such a golf swing apparatus as an input to an application comprising a golf simulation, as is expressed in claim 31. Baynton therefore does not teach: establishing an object fundamental path representing a path of motion of an object in the computer application, wherein the object comprises a golf club, wherein the object fundamental path comprises a path suited for perception of the swing of the golf club, and wherein the object moves along the object fundamental path responsive to a component of input device motion along the device fundamental path, as is expressed in claims 3 and dependent claim 31. Moreover, Baynton does not teach that the object fundamental path and the device fundamental path have different shapes, as is recited in claim 38.

Similar to Baynton, Rosenberg and Meredith teach implementing an input apparatus, which comprises a pool cue, and which provides for feedback to the user. Rosenberg and Meredith particularly teach implementing such an apparatus as an input to an application comprising a pool simulation by: establishing an object fundamental path representing a path of motion of an object in the computer application, wherein the object comprises a pool cue, wherein the object fundamental path comprises a path suited for perception of the motion of the pool cue, wherein the object moves along the object fundamental path responsive to a component of input device motion along the device fundamental path; and wherein force is applied to the input apparatus in response to interaction of the object with other objects in the application. It is understood that the object fundamental path and the device fundamental path may have different shapes, with discrepancies caused by, for example, distortions in the display screen displaying the object.

It would have been obvious to one of ordinary skill in the art, having the teachings of Baynton, Meredith, and Rosenberg before him at the time the invention was made, to modify the input device taught by Baynton such that it is implemented in a golf simulation, analogous to the pool simulation of Meredith and Rosenberg. In other words, it would have been obvious to modify the golf swing apparatus of Baynton such that it serves as an input to an application comprising a golf simulation, specifically by: establishing an object fundamental path representing a path of motion of an object in the computer application, wherein the object comprises a golf club, wherein the object fundamental path comprises a path suited for perception of the motion of the golf club, wherein the object moves along the object fundamental path responsive to a component of input device motion along the device fundamental path, and wherein force is applied to the input apparatus in response to interaction of the object with other objects in the application. It would have been advantageous to one of ordinary skill to utilize this combination, because using the apparatus as an input to such a simulation would allow the user to view the results of his or her swing, as is demonstrated by Meredith. Thus, in addition to providing entertainment value, the simulation would allow the user to better improve his or her swing.

K. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over the U.S. Patent of Stewart, which is described above, and also over the U.S. Patent of Rosenberg II, which is also described above. As described above, Stewart teaches a method like that recited in claim 35, wherein an object is moved along an object fundamental path responsive to a component of haptic input device motion along a device fundamental path, and a force is applied to the haptic

input device responsive to a component of input device motion not along the device fundamental path. Stewart, however, does not explicitly disclose that such movement and force response is applied in response to accepting a signal from the user indicating that such interaction is desired, as is expressed in claim 37.

Like Stewart, Rosenberg II similarly describes a haptic user interface (for example, see column 5, line 56 – column 6, line 9). Rosenberg II particularly discloses that force feedback may only be applied in response to detecting a safety switch activated by the user (see column 17, lines 46-67).

It would have been obvious to one of ordinary skill in the art, having the teachings of Stewart and Rosenberg II before him at the time the invention was made, to modify the haptic interface of Stewart to include the safety switch of Rosenberg II, such that if the switch is actuated, an object is moved along an object fundamental path responsive to a component of haptic input device motion along a device fundamental path, and a force is applied to the haptic input device responsive to a component of input device motion not along the device fundamental path, and such that if the switch is not activated, a cursor is simply moved corresponding to motion of the input device, with no force feedback. It would have been advantageous to one of ordinary skill to utilize this combination, because such a switch may increase the safety of the haptic interface, as is taught by Rosenberg II (for example, see column 17, lines 46-67).

(10) Response to Argument

Rejections under 35 U.S.C. 102

A. Rejections of Claims 3-4, 7-8, 11-13, 19-24, and 26-30 under 35 U.S.C. 102(b) as anticipated by Rosenberg

A. Claims 3, 7, 8, 10, 11, and 13 argued together, but separately from other claims under this ground of rejection.

Regarding claim 3, and claims 7, 8, 10, 11, and 13 with depend thereon, the Appellant notes that Rosenberg teaches applying various types of force feedback within an application:

> *Rosenberg teaches the use of a groove formed by specific force profiles to allow a user to keep a cursor* ***within*** [sic] *a scrollbar. Rosenberg column 38 line 38 – column 9 line 39. Rosenberg also teaches providing bumps or other force impulses to communicate to the user when a cursor moving across a screen* ***crosses window boundaries*** [sic] *within the GUI. Rosenberg column 44 line 65 – column 45 line 21.* (Appeal Brief, page 13).

As asserted in previous Office Action, and in the rejections repeated above, the Examiner considers the groove force of Rosenberg an object fundamental path, having a corresponding device fundamental path, like recited in claim 3. The Appellant, however, appears to argue that Rosenberg fails to teach the limitations of claim 3, because according to the Appellant, Rosenberg does not teach applying a force to the input device responsive to interaction of an object with the application while the cursor is in the groove, i.e. while the device is within the device fundamental path:

> *Rosenberg has no teaching, however, of (1) applying forces to an input device based on interaction of an object with the application combined with (2) applying forces to the input device while the cursor is a groove.* (Appeal Brief, page 13).

> *...Claim 3 recites the limitation that forces responsive to interaction with the application be applied to the device (and hence communicated to the user of the device)* ***while*** [sic] *the user is moving an input device along the device fundamental path.* (Appeal Brief, page 14).

In response, the Examiner notes that there is absolutely no such limitation in claim 3. Rather, claim 3 recites, in terms of applying force:

> e) Applying a force to the haptic input device responsive to a component of haptic input device motion not along the device fundamental path; and
>
> f) Applying a force to the haptic input device responsive to interaction of the object with the application.

As shown, there is no recitation or suggestion that a force is applied to the haptic input device responsive to interaction of the object with the application (i.e. the claimed step "f"), *while the user is moving the input device along the device fundamental path.* That is, it is perfectly within the scope of claim 3 to apply a force to the haptic input device responsive to interaction of the object with the application *while the device is* ***not*** *on the device fundamental path.* As admitted by the Appellants, Rosenberg teaches applying such a force, e.g. a "bump," to a haptic input device responsive to interaction of an object, e.g. a cursor, within an application while the device is not on a device fundamental path, i.e. while the cursor is not in a groove:

> *Rosenberg teaches various ways to use force feedback to assist a user interacting with a GUI. Rosenberg teaches the use of a groove formed by specific force profiles to allow a user to keep a cursor* ***within*** [sic] *a scrollbar. Rosenberg column 38 line 38 – column 9 line 39. Rosenberg also teaches providing bumps or other force impulses to communicate to the user when a cursor moving across a screen* ***crosses window boundaries*** [sic] *within the GUI. Rosenberg column 44 line 65 – column 45 line 21. Rosenberg's grooves* ***keep*** [sic] *a cursor within a region of the GUI. Rosenberg's bumps, on the other hand, communicate when*

> *the cursor* ***crosses*** [sic] *boundaries when moving within a scroll bar. According to Rosenberg's teaching, a user can be* ***moving within*** [sic] *a region of the GUI corresponding to a groove (e.g., within a scroll bar portion of the GUI), or can be* ***moving across*** [sic] *regions of the GUI (e.g., moving a cursor across multiple regions of the display).* (Appeal Brief, page 13).

Accordingly, it is maintained that Rosenberg in fact teaches applying a force to a haptic input device responsive to a component of haptic input device motion not along a device fundamental path, and applying a force to the haptic input device responsive to interaction of an associated object with an application, as is expressed in claim 3.

Moreover, the Examiner notes that even if claim 3 did express applying a force to the haptic input device responsive to interaction with the application *while the user is moving the input device along a device fundamental path*, Rosenberg is still considered to teach such a limitation. For example, Rosenberg explicitly asserts that force feedback may be applied to the input device responsive to cursor interaction with a scroll bar thumb while in the groove associated with a scroll bar, i.e. while the user is moving the input device along the device fundamental path (for example, see column 60, lines 14-29).

Further concerning claim 3, the Appellant asserts that Rosenberg teaches controlling a cursor in an application, but argues that such a cursor does not constitute an "object" like claimed. In response, the Examiner notes that the specification of the present application provides no explicit definition for an object, and provides no suggestion or recitation that such an object cannot be a cursor. As demonstrated by Rosenberg, and as is well known in the art, a cursor is a graphical user interface object created by an application (e.g. an operating system), and is displayed in the graphical user interface of the application (for example, see the cursor, reference number 506, in figure 19 of Rosenberg). Thus, given the broadest most reasonable

definition of an object in a computer application, the cursor of Rosenberg is considered such an object.

Moreover, the Examiner notes that even if the cursor of Rosenberg could not be considered such an object, the force feedback of Rosenberg is similarly applicable to other graphical user interface objects. For example, as asserted in the previous Office Action and in the rejections repeated above, the groove force of Rosenberg may also be considered to be applicable to a scroll bar "thumb," such that the user is freely able to drag the thumb along the length of the scroll bar, but movement out of the scroll bar is resisted (see column 59, line 49 – column 50, line 39). Additionally, it is understood that "collision" forces may additionally be applied (i.e. at the top and bottom of the scroll bar) when dragging the scroll bar thumb, i.e. responsive to interaction of the thumb with the application (see column 59, line 49 – column 60, line 45). Such a thumb may thus be considered an "object in a computer application," like that claimed.

Accordingly, the Examiner maintains that Rosenberg anticipates claim 3.

A. Claim 4 argued separately

Regarding claim 4, the Appellant notes that claim 4 depends on claim 3, and argues that Rosenberg does not anticipate claim 4 for same reasons that Rosenberg does not anticipate claim 3. However, as asserted above, Rosenberg is considered by the Examiner to anticipate claim 3, and accordingly, the Examiner disagrees with this argument.

Further regarding claim 4, the Appellant notes that Rosenberg teaches associating a simulated mass with objects in an application, but asserts that such a simulated mass is not

applied while the objects move within Rosenberg's groove-constrained slider bar, i.e. predefined object path. The Appellant thus concludes that, "Rosenberg does not teach forces corresponding to momentum or inertia of an object that is moving within a defined object path, and does not anticipate Claim 4." (Appeal Brief, page 15). In response, the Examiner notes that claim 4 recites:

> A method as in Claim 3, further comprising applying forces to the haptic input device corresponding to motion of the object in the application, wherein the forces provide a perception of momentum and inertia of the haptic input device corresponding to momentum and inertia of the object in the application.

As shown, the "forces" applied in claim 4 are not in any way described as being related or associated with the forces applied in claim 3 (i.e. those described in steps "e" and "f"); the forces applied in claim 4 are entirely distinct from those in claim 3. Claim 3 does express moving an object along an object fundamental path, and claim 4 does recite applying forces corresponding to "motion" of the object, but the motion defined in claim 4 is not recited or even suggested as being associated with *only* motion of the object along the object fundamental path. Accordingly, it is understood that it is perfectly within the scope of claim 4 to apply a forces to the haptic input device corresponding to other motion of the object in the application, i.e. motion while the object is not in the object fundamental path. Rosenberg clearly teaches applying such forces to the object (i.e. the cursor), wherein the forces correspond to the momentum and inertia of the object in the application:

> Cursor **506** could be assigned a mass of its own so that the user object will feel collision forces in accordance with the mass of cursor **506**, the velocity of the cursor across the screen, and a [sic] assigned

> compliance of the cursor and the object moved into. (Column 60, lines 54-58).

The Examiner therefore maintains that Rosenberg anticipates claim 4.

Moreover, the Examiner notes that, even if claim 4 did express applying forces corresponding to the momentum or inertia of an object *while the object is moving within a defined object path*, Rosenberg would still anticipate the claim. For example, Rosenberg clearly teaches applying forces to the input devices corresponding to the momentum and inertia of an object (i.e. a scroll bar thumb) while the object is moving within a defined object path (i.e. a scroll bar):

> Thumb **580** can also be assigned inertia forces as described with reference to FIG. 21. The user could feel the inertia "mass" of the thumb when moving it along guide **582**. (Column 60, lines 24-27).

Accordingly, the Examiner again maintains that Rosenberg anticipates claim 4.

A. Claims 19 and 20, argued together, but separately from other claims under this ground of rejection.

Regarding claims 19 and 20, the Appellant notes that these claims depend on claim 3, and argues that Rosenberg does not anticipate claims 19 and 20 for same reasons that Rosenberg does not anticipate claim 3. However, as asserted above, Rosenberg is considered by the Examiner to anticipate claim 3, and accordingly, the Examiner disagrees with this argument.

Further regarding claims 19 and 20, the Appellant notes that Rosenberg teaches that a user can position a cursor (i.e. the claimed "object") within a path and, if the user's input device has a degree of freedom not used in defining the path, the user can move the device in that degree of freedom to initiate a command. The Appellant argues that such an initiation of a

command does not change a characteristic of the cursor, that is, the Appellant argues that Rosenberg fails to teach changing a characteristic of the object (i.e. the cursor) responsive to motion of the haptic input device off the device path, as is recited in claim 19. The Examiner respectfully disagrees with this argument. As noted by the Appellant, a "characteristic" is defined as, for example, a "distinguishing trait, quality, or property." (Appeal Brief, page 15). Such a distinguishing property may pertain to, for example, the speed of the cursor, a visual attribute of the cursor, or in this case, information associated with the cursor. For example, it is well known in the art that in programming a user interface responsive to cursor interaction, various user input device events are associated with the cursor; in the case of a mouse, for instance, the user interface is programmed to respond to various input device events, such as that associated with a mouse button being pressed at a particular cursor location. Each event (e.g. pressing a mouse button) is distinct from each other event (e.g. not pressing a mouse button), and thus serves as a distinguishing property used to program the interface at a given cursor location. Initiating a command gesture is thus an input event that modifies a distinguishing property associated with the cursor. Accordingly, Rosenberg teaches changing a characteristic of the cursor responsive to command gesture, the command gesture being motion of the haptic input device off the device path, as is claimed.

Assuming, for the sake of argument, that the above-described command gesture of Rosenberg does *not* modify a distinguishing property of the cursor (an idea with which the Examiner does not agree), the Examiner notes that Rosenberg presents other examples of modifying a characteristic of the cursor responsive to motion of the haptic input device off the device path. For example, location may be considered a distinguishing property of the cursor.

Since the cursor moves in response to movement of the input device, moving the input device changes a distinguishing property (i.e. the location) of the cursor. Accordingly, Rosenberg teaches changing a characteristic of the cursor, i.e. its location, responsive to motion of the haptic input device, including motion off the device path, as is claimed.

Assuming further, for the sake of argument, that Rosenberg fails to teach changing a characteristic of the cursor responsive to motion of the haptic input device off the device path (an idea with which the Examiner does not agree), the Examiner notes that it is notoriously well known in the art to programmatically modify a characteristic of a cursor in response to a user command, such as a mouse click (for example, see column 9, lines 37-54 of U.S. Patent No. 6,971,071; see column 6, line 24 – column 7, line 48 of U.S. Patent No. 5,655,066; and see column 9, line 66 – column 10, line 26 of U.S. Patent No. 6,950,691). Accordingly, it would have been obvious to one of ordinary skill in that art to modify the cursor of Rosenberg such that a characteristic of the cursor changes in response to a user command generated with the haptic input device, i.e. in response to motion of the haptic input device off the device path.

<u>A. Claim 21, argued separately</u>

Regarding claim 21, the Appellant notes that this claim depends on claim 3, and argues that Rosenberg does not anticipate claim 21 for same reasons that Rosenberg does not anticipate claim 3. However, as asserted above, Rosenberg is considered by the Examiner to anticipate claim 3, and accordingly, the Examiner disagrees with this argument.

Further regarding claim 21, the Appellant asserts that applying Rosenberg to the additional limitation of claim 21 would require that Rosenberg's groove forces vary in

magnitude as the cursor moves along the slider bar. The Appellant argues that Rosenberg describes forces applied to motion outside the object path, but that Rosenberg does not mention any variation of such forces as the object moves along the path. In response, the Examiner first notes that the limitation of claim 21 – "wherein the magnitude of the force [i.e. the force recited in part "e" of claim 3] is partially dependent on the position of the object along the object fundamental path" – is not described in the specification, as is asserted in the Office Action mailed on 9/9/2004. Secondly, the Examiner notes that Rosenberg nevertheless teaches varying the magnitude of the groove force applied to the user input device as the cursor moves along a slider bar. Rosenberg clearly states that the scroll bar "guide" may have a "dead region" of zero width, meaning that the groove force (e.g. the internal force of the guide) is applied as the cursor moves laterally away from this point (i.e. line "L") but *while still within the scroll bar*:

> The scroll bar or "slider" **581** also preferably is designated as a target of the present invention. The scroll bar preferably includes a "thumb" **580**, a guide **582** in which to move the thumb, and arrows **583**. Cursor **506** can be positioned over thumb **580** in the scroll bar **581** for the window **501** and the user can scroll or move the view of icons, text, or other information shown in window **501** by moving thumb **580** in a vertical direction along guide **582**, as is well known to those skilled in the art…Internal forces of the guide are preferably equivalent to those of FIG. 20b. The capture forces on the top and bottom sides of the groove prevent cursor **506** from easily moving onto arrows **583** when moving thumb **580**. <u>In an alternate embodiment, the dead region of guide **582** has zero width, so that the cursor is always attracted to a point halfway across the width of the guide, i.e. an entry capture force to the middle line L of the guide.</u> This would be close to a groove force model, except that the sides of guide **582** near arrows **583** would have a barrier force and thus be like a divot. [Emphasis Added]. (Column 59, line 49 – column 60, line 8).

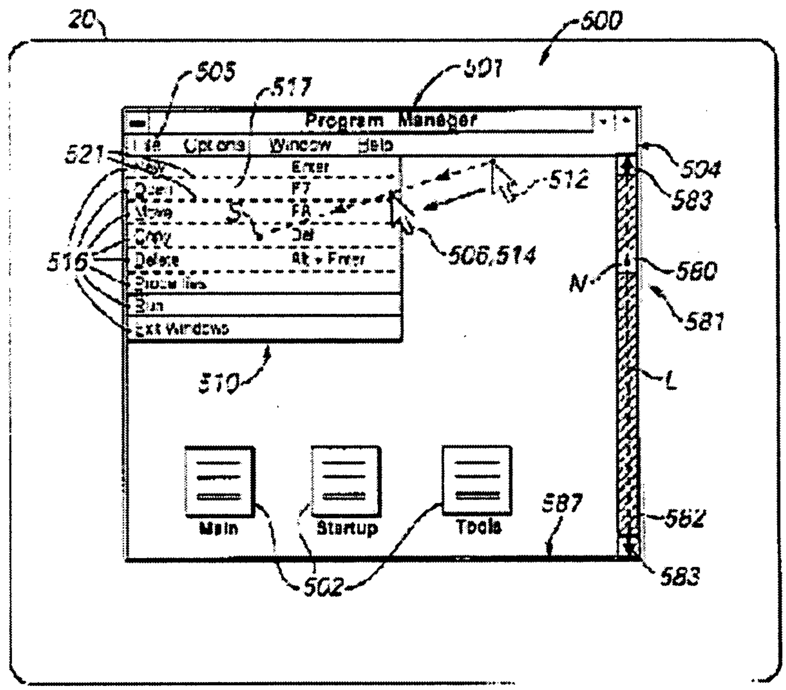

Figure 21

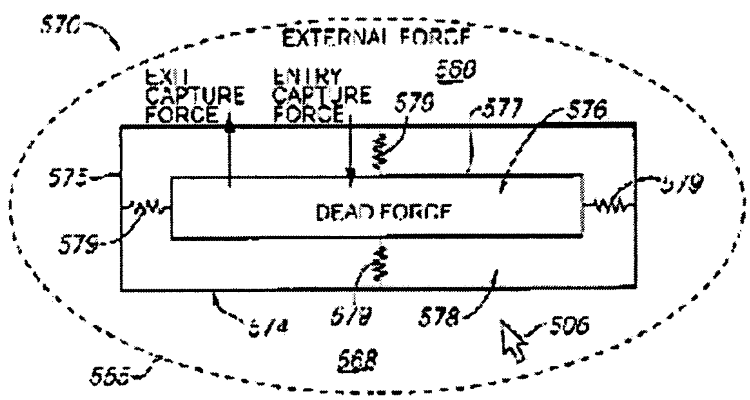

Figure 20b

Rosenberg further teaches, that while the cursor is within the scroll bar, other forces may *also* be applied to input device, such as "external forces," which attract the cursor to the scroll bar thumb or arrows:

> Preferably, thumb **580** and arrows **583** are considered children objects of guide **582**, i.e., the thumb and arrows are at a lower hierarchical level than the guide and are considered "within" the guide. Thus, the external forces of the thumb and arrows are only applicable when cursor **506** is positioned within the guide. The external forces of arrows **583** are preferably zero, and thumb **580** preferably has an attractive external force. The internal forces of thumb **580** and arrows **583** are preferably similar to those described with reference to FIG. 20b. (Column 60, lines 14-23).

It is understood that these attractive external forces are applied, depending on the distance from the cursor to the thumb or arrow:

> A force field type force attracts or repulses the user object with respect to a specific position. This force can be defined by command parameters such as a field magnitude and the specific field origin position which the force field is applied with respect to. A sense parameter can be included to indicate an attractive field or a repulsive field. For example, the force field can be an attractive field to simulate a force of gravity between the field origin position and a user-controlled cursor or graphical object. Although the field origin position can be thought of as a gravitational mass or an electric charge, the attractive force need not depend on the inverse square of displacement from the specific position; for example, the force can depend on an inverse of the displacement. The attractive force field also attempts to maintain the user object at the field origin position once the user object has been moved to that position. (Column 40, lines 21-36 of Rosenberg).

Accordingly, the external force associated with the thumb or scroll bar arrows varies in magnitude according to the position of the cursor within the scroll bar. As the force applied to the device within the scroll bar is a combination of these external forces and the internal force of the guide, the force applied to the input device varies in magnitude as the cursor moves along the scroll bar.

Accordingly, the Examiner maintains that Rosenberg anticipates claim 21.

A. Claim 22, argued separately

Regarding claim 22, the Appellant notes that this claim depends on claim 3, and argues that Rosenberg does not anticipate claim 22 for same reasons that Rosenberg does not anticipate claim 3. However, as asserted above, Rosenberg is considered by the Examiner to anticipate claim 3, and accordingly, the Examiner disagrees with this argument.

Further regarding claim 22, the Appellant asserts that applying Rosenberg to the additional limitation of claim 22 would require that Rosenberg's groove forces vary in magnitude as the cursor interacts with the application. The Appellant argues that has no teaching of such forces varying based on interaction of a cursor with the application. In response, the Examiner first notes that the limitation of claim 22 – "wherein the magnitude of the force [i.e. the force recited in part "e" of claim 3, as argued by the Appellant] is partially dependent on interaction of the object with the application" – is not described in the specification, as is asserted in the Office Action mailed on 9/9/2004. Secondly, the Examiner notes that Rosenberg nevertheless teaches various ways in which the magnitude of the force, applied to the device responsive to motion off the device path, is varied based on interaction of the cursor with the application. For example, Rosenberg discloses that the magnitude of the groove force varies according to the distance of the cursor from the center of the groove; as the user moves the cursor away from the center of the groove, the magnitude of the force increases (see figure 15, in addition to its description in column 38, line 38 – column 39, line 9). Moving the cursor away from a scroll bar associated with such a groove is considered interaction with the application,

since the application responds (with force output) in response to such cursor movement. The magnitude of the force is thus partially dependent on interaction of the cursor with the application, i.e. the position the cursor is moved relative to the scroll bar. As another example, Rosenberg teaches that a "collision" force may be applied as the cursor passes over objects, such as an edge of a window (see column 50, lines 24-62). The scroll bar of Rosenberg, as is the case with most scroll bars, is positioned along the edge of a window (for example, see figure 21). That is, a groove force may be applied resisting cursor motion away from the scroll bar, and an additional collision force may be applied as the cursor crosses a window boundary, i.e. interacts with the application. The magnitude of the total force, i.e. the force applied to the input device responsive to motion off the device path, is thus partially dependent on interaction of the cursor with the application. As a third example, Rosenberg discloses that the magnitude of forces associated with particular targets (e.g. the scroll bar) may be varied in response to selecting a menu command (see column 52, lines 54-59). As is known in the art, such menu commands are generally initiated in response to interaction between the cursor and the application, for example, the cursor is positioned over the menu command and an associated input device button (e.g. a mouse button) is selected. Accordingly, the magnitude of the force applied to the input device responsive to motion off the device path is thus partially dependent on interaction of the cursor with the application.

Accordingly, the Examiner maintains that Rosenberg anticipates claim 22.

A. Claim 23, argued separately

Regarding claim 23, the Appellant notes that this claim depends on claim 3, and argues that Rosenberg does not anticipate claim 23 for same reasons that Rosenberg does not anticipate claim 3. However, as asserted above, Rosenberg is considered by the Examiner to anticipate claim 3, and accordingly, the Examiner disagrees with this argument.

Further regarding claim 23, the Appellant submits that the Examiner's rejection relies on concepts found in two separate and unrelated "portions" of Rosenberg, "with the only teachings that the concepts might be used together found in the elements of Appellant's claim 23, with the missing link supplied by the Examiner 'considering' Rosenberg's targeting of graphical interface objects to be a user-assistance parameter, a consideration with no basis in language or the teaching of Rosenberg." (Appeal Brief, page 17). The Appellant asserts that the first portion (i.e. column 38, lines 38-53 of Rosenberg) has no mention of forces with variable magnitudes, that the second portion (i.e. column 52, lines 54-59) has nothing to do with groove forces, and that neither has any mention of user-assistance parameters. Based on such reasoning, the Appellant argues that Rosenberg fails to teach groove forces dependent on a user-assistance parameter, as required by claim 23.

In response, the Examiner submits that the rejection for claim 23 only relies on the first portion of Rosenberg; the second portion was presented with respect to claim 24. This first portion is as follows:

> FIG. 15 is a graph **342** showing a force versus displacement relationship for a groove force of the present invention. The groove force provides a linear detent sensation along a given degree of freedom, shown by ramps **344**. The user object feels like it is captured in a "groove" where there is a restoring force along the degree of freedom to keep the stick in the groove. This restoring force groove

> is centered about a center groove position C located at the current location of the user object when the host command was received. Alternatively, the location of the center groove position can be specified from a command parameter along one or more degrees of freedom. Thus, if the user attempts to move the user object out of the groove, a resisting force is applied.
>
> The magnitude (stiffness) parameter specifies the amount of force or resistance applied. (Column 38, lines 38-53).

Figure 15, which is described by the above portion of Rosenberg, is as follows:

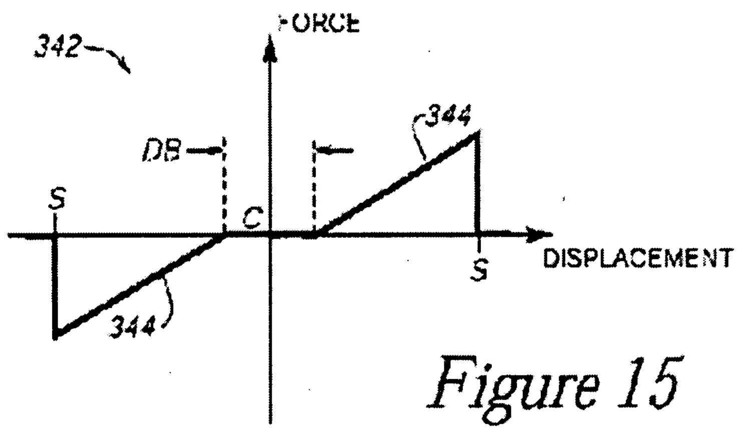

Figure 15

According to the Appellant, this first portion of Rosenberg teaches groove forces to keep a cursor along a linear path, and teaches that the groove force magnitude can be specified by a stiffness parameter, but has no mention of any variation in the stiffness parameter. In response, the Examiner notes that claim 23 does not explicitly express any variation in the claimed "user-assistance parameter." Claim 23 instead only recites that the magnitude of the force is "partially dependent on a user-assistance parameter of the interface." Regardless, the Examiner asserts that the magnitude (i.e. stiffness) parameter of Rosenberg, which is considered a user-assistance parameter, is in fact variable. Rosenberg discloses that this parameter is part of a command (e.g. a "groove" command), issued by a host computer to the user input device, to affect the force feedback provided by the device (see column 22, line 23 – column 25, line 67; see column 30,

lines 1-57; and column 37, line 29 – column 38, line 29). The commands are available to a programmer to implement force feedback in an application (for example, see column 30, lines 22-31; and column 32, lines 8-33). Rosenberg further discloses that the parameters are used to "customize and/or modify" the type of force associated with the command (see column 32, lines 25-33). There would be absolutely no point in including such parameters within a command if the parameters are each static, and not variable; the parameters would have no way of indicating the customization of the force associated with the command, and there would be absolutely no reason to specify the parameters when specifying a command, if the parameters are each always associated with one distinct, non-changeable, non-programmable, value. Accordingly, the parameters must be variable. It is therefore maintained that the magnitude (i.e. stiffness) parameter associated with the groove command of Rosenberg is variable.

Further regarding the first portion cited in the rejection for claim 23, the Appellant argues that this portion fails to mention any user-assistance parameter. That is, the Appellant apparently does not consider the above-described magnitude parameter of Rosenberg to be a user-assistance parameter. The Appellant, however, provides no reasoning as to why such a magnitude parameter is not a user-assistance parameter, and provides no argument in response to the Examiner's reasoning, presented in the Final Rejection mailed 5/20/2005 and repeated in the rejection above, as to why the magnitude parameter of Rosenberg is in fact a user-assistance parameter. Moreover, the specification of the present application provides no explicit definition for a "user-assistance parameter," and in fact, does not even mention such a parameter. Regardless, the Examiner notes that Rosenberg is directed towards providing force feedback in order to assist users of a graphical user interface in performing various inputs (see column 1, line

65 – column 2, line 59; and column 44, lines 50-64). As the above-described magnitude (i.e. stiffness) parameter of Rosenberg identifies the amount of force applied for a particular groove force, the groove force used to assist the user, this magnitude parameter identifies the amount of assistance to provide the user. That is, this magnitude parameter is a user-assistance parameter, given the broadest, most reasonable definition of such a user-assistance parameter.

Accordingly, the Examiner maintains that Rosenberg anticipates claim 23.

A. Claim 24, argued separately

Regarding claim 24, the Appellant notes that this claim depends on claim 23, and argues that Rosenberg does not anticipate claim 24 for same reasons that Rosenberg does not anticipate claim 23. However, as asserted above, Rosenberg is considered by the Examiner to anticipate claim 23, and accordingly, the Examiner disagrees with this argument.

Further regarding claim 24, the Examiner asserted in the Final Rejection of 5/20/2005 that Rosenberg teaches (i.e. at column 52, lines 54-59), that the user may adjust the magnitude parameter of the groove force taught by Rosenberg (i.e. taught at column 38, lines 38-53):

> *Concerning claims 23 and 24, Rosenberg discloses that the magnitude of the force resisting the interface device's motion off of the device fundamental path is partially dependent on a parameter of the interface, namely a "magnitude parameter" (for example, see column 38, lines 38-53). As a major goal of such force feedback is to assist the user in targeting graphical user interface objects (see column 44, lines 50-64), this magnitude parameter is considered a "user-assistance parameter," like recited in claim 23. Additionally, Rosenberg discloses that the user may adjust such parameters to suit his or her needs (for example, see column 52, lines 54-59). The magnitude parameter may thus be established by a measure of the user's proficiency in manipulating the interface device.* (Final Rejection, page 10).

The Appellant, however, in their arguments concerning claim 23, assert that the "second" cited portion of Rosenberg (i.e. column 52, lines 54-59) teaches that a programmer of a graphical user interface can specify attractive forces that can be used to attract a cursor to a specific target location on the GUI, and teaches that a user of such a GUI might be able to designate force magnitudes associated with particular targets, but has nothing to do with groove forces. This portion is as follows:

> In addition, a programmer of the GUI **500** or of an application program running under the GUI is preferably able to control the magnitude of the forces associated with particular targets displayed (or the "masses" of targets). For example, the force field host command and command parameters, described above, may be able to designate a magnitude for particular displayed windows. Each target could thus have a different, predetermined force associated with it. This might allow a software developer to designate a desired force to be associated with a particular window for his application program running under GUI **500**. <u>In addition, in some embodiments, a user of GUI **500** might be allowed to designate particular magnitudes of forces associated with targets. A menu command or other standard method to allow the user to associate forces with particular targets can be implemented.</u> (Emphasis added, column 52, lines 44-59).

The Appellant, in their arguments concerning claim 23, allege that this "second" portion of Rosenberg (i.e. column 52, lines 54-59) has nothing to do with the groove force or associated parameters described in the "first" portion (i.e. column 38, lines 38-53), and assert that there is no suggestion that this second portion may be applied to teach adjusting the magnitude parameter of a groove force. The Examiner respectfully disagrees. Rosenberg clearly teaches within this second portion that the user may adjust the magnitudes of forces associated with "targets:"

> In addition, in some embodiments, a user of GUI **500** might be allowed to designate particular magnitudes of forces associated with targets. A menu command or other standard method to allow the user to associate

> forces with particular targets can be implemented. (Column 52, lines 44-59).

Moreover, Rosenberg clearly demonstrates that such targets may be scroll bars, having an associated groove force:

> Such targets can include, for example, icons for executing application programs and manipulating files; windows for displaying icons and other information; pull-down menus for selecting particular functions of the operating system or an application program; buttons for selecting presented options; and scroll bars or "sliders" for scrolling information in windows. (Column 2, lines 6-12).

> Preferably, the force sensation applied to the physical object is at least partially determined by a location of the cursor in the GUI with respect to targets associated with the graphical objects in the GUI. These targets may include or be associated with such graphical objects as icons, windows, pull-down menus and menu items, scroll bars ("sliders"), and buttons. (Column 3, lines 17-24).

> If the target is not a radial button, the process continues to step 640, in which the process checks if the target is a slider. If so, step 650 assigns rectangular dead, capture, and external ranges to the guide, thumb, and arrows as explained previously. If the slider is implemented as a one dimensional groove, then the dead range would be linear, i.e., zero in one dimension. The process then continues to step 652, described below. (Column 62, line 59 – column 63, line 4).

In addition, Rosenberg clearly demonstrates that the magnitude of the groove force is specified by a magnitude, i.e. stiffness, parameter, as is demonstrated above in the discussion concerning claim 23. As further shown above in the discussion concerning claim 23, this magnitude parameter is considered a user-assistance parameter, like that claimed. Accordingly, it is understood that when a user adjusts the magnitude of a force, such as that of a groove associated with a scroll bar, the associated magnitude parameter is adjusted either directly or through some

particular programmatic implementation. At the very least, it would have been obvious to adjust the magnitude parameter as such when the user adjusts the magnitude of the groove force associated with a scroll bar. It is consequently maintained that Rosenberg teaches that the user may adjust the magnitude of forces associated with various GUI targets, including that of a scroll bar groove, wherein this magnitude is specified by a magnitude parameter, i.e. a user-assistance parameter.

Further regarding claim 24, the Appellant notes this claim recites that the user-assistance parameter is established by a measure of the user's proficiency in manipulating an input device, and argues that Rosenberg has no mention of any measure of user proficiency, or of any adjustment in groove forces based on such a measure. In response, the Examiner notes that Rosenberg is directed towards providing force feedback in order to assist users of a graphical user interface in performing various inputs (see column 1, line 65 – column 2, line 59; and column 44, lines 50-64). As described above, Rosenberg teaches that the user may adjust the magnitude (i.e. the magnitude parameter) of this force feedback. It is therefore understood that the user would increase the magnitude if he or she requires more assistance with the input device, and decrease the magnitude if he or she requires less assistance with the input device. Accordingly, the magnitude parameter, which as described above is considered a user-assistance parameter, is established by a measure (e.g. as determined by the user) of the user's proficiency in manipulating the input device.

Accordingly, the Examiner maintains that Rosenberg anticipates claim 24.

A. Claims 26, 27, and 30, argued together but separate from other claims under this ground of rejection

Regarding claims 26, 27, and 30, the Appellant notes that these claims depend on claim 3, and argues that Rosenberg does not anticipate claims 26, 27, and 30 for same reasons that Rosenberg does not anticipate claim 3. However, as asserted above, Rosenberg is considered by the Examiner to anticipate claim 3, and accordingly, the Examiner disagrees with this argument.

Further regarding claims 26, 27, and 30, the Appellant submits that the Examiner's rejection via Rosenberg requires that the user move a cursor to an on-screen target in order to supply an initiation signal. The Appellant submits that the target has a defined location, and that therefore, its associated device fundamental path (e.g. its associated groove) also has a defined location. Based on this, the Appellant asserts that such a path must necessarily be established before the signal is supplied, and concludes that Rosenberg fails to anticipate claims 26, 27, and 30, which include the limitation that the path not be established until after the user supplies an initiation signal, and that the path is established based in part on the position of the cursor when the signal is supplied. In response, the Examiner notes that Rosenberg discloses that a groove force may be an internal force, meaning that it is established once the user positions a cursor within a region associated with the groove (see column 3, lines 37-49; and see column 59, line 49 – column 60, line 13). The groove force (i.e. the device fundamental path) is thus in fact established *after* moving the cursor within the target, which is considered a motion-initiation signal. Moreover, the Examiner notes that claim 26, upon which each of claims 27 and 30 depends, recites the limitation that the device fundamental path is established "according to a defined path and the position of a cursor controlled by the user when the motion-initiation signal

was supplied." There is no recitation that the device fundamental path is *located* according to the position of the cursor when the motion-initiation signal was supplied. Thus, even if the device fundamental path of Rosenberg has a defined location, which it does not, this fundamental path may still be established (e.g. at a point in time) according to a defined path and the position of a cursor controlled by the user when the motion-initiation signal was supplied, as is claimed. For example, as asserted in the Final Rejection of 5/20/2005, Rosenberg discloses that a groove force may be an internal force, established once the user positions a cursor within a region associated with the groove (see column 3, lines 37-49; and see column 59, line 49 – column 60, line 13). Accordingly, the user supplies a motion initiation signal by positioning the cursor within a region (e.g. a scroll bar) associated with the groove. In response, the associated device fundamental path is established according to a defined path (e.g. a predefined groove force) and, since the motion initiation signal entails particular positioning of the cursor, the path is also established according to the position of the cursor.

Moreover, even if claim 26, 27, or 30 did express the limitation that the device fundamental path is *located* according to the position of the cursor when the motion-initiation signal was supplied, Rosenberg would still be considered to teach this limitation. The device fundamental path of Rosenberg does not have a predefined, constant location relative to the input device, since the rate of movement of the cursor does not necessarily have a one-to-one correspondence with the rate of movement of the input device, as is well known in the art. For example, as is known in the art, if a cursor is at one time positioned at a point within the display and the user input device (e.g. a mouse) is positioned at a corresponding location within its range of motion, returning the cursor at a later time to the same point within the display does not

necessarily entail positioning the input device at the same corresponding location within is range of motion (for example, see column 2, line 42 – column 4, line 8 of U.S. Patent No. 6,288,705). Thus when positioning a cursor within a scroll bar, the input device may be positioned at a location different from any other time that the cursor is at the same spot within the scroll bar, meaning that the device fundamental path (i.e. the groove established in response to moving the cursor within the scroll bar), which is associated with the scroll bar, would have a different location within the input device's range of motion each time the cursor is placed within the scroll bar. Moreover, since the groove (i.e. the device fundamental path) is established in response to moving the cursor within the scroll bar as is shown in the previous paragraph, the position of the groove relative to the input device is established according to the location of the cursor within the scroll bar. For example, if the cursor is initially positioned at the top of the scroll bar, the device fundamental path (i.e. groove) is established relative to the input device, such that the input device is located near the top of the device fundamental path. Conversely, if the cursor is initially positioned at the bottom of the scroll bar, the device fundamental path is established such that the input device is located near the bottom of the path.

Accordingly, the Examiner maintains that Rosenberg anticipates claims 26, 27, and 30.

A. Claims 28 and 29, argued together but separately from other claims under this ground of rejection

Regarding claims 28 and 29, the Appellant notes that these claims depend on claim 26, and argues that Rosenberg does not anticipate claims 28 and 29 for same reasons that Rosenberg

does not anticipate claim 26. However, as asserted above, Rosenberg is considered by the Examiner to anticipate claim 26, and accordingly, the Examiner disagrees with this argument.

Further regarding claims 28 and 29, the Examiner asserted in the Final Rejection of 5/20/2005 that that the determination of a cursor within a region associated with a groove entails a switch. The Appellant, however, argues that such an assertion is in error, since "[n]o definition of 'switch' includes 'positioning a cursor within a groove'" (Appeal Brief, pages 18-19). While it is true that, in the art, a switch has a limited meaning, such as "a device used to break or open an electric circuit or to divert current from one conductor to another," the specification of the current application itself provides a much broader meaning of such a switch. According to the specification,

> *The user is provided a switch which, when actuated, causes the interface to provide an interaction according to a device fundamental path. The switch can comprise, as examples, a button to press or release, a voice command to speak, a key to press or release, a defined motion of the input device (e.g., a tight circle motion) or any of many indication means known to those skilled in the art.* (Specification, page 9, lines 13-17).

Moving the cursor to a defined region within a GUI (i.e. a scrollbar associated with a groove) with the input device is considered "a defined motion of the input device," and is certainly an "indication means known to those skilled in the art." Accordingly, the Examiner maintains that the determination of a cursor within a region associated with a groove entails a switch.

Further regarding claims 28 and 29, the Appellant asserts that, if positioning a cursor within a groove constitutes a switch, then the path must necessarily exist before the switch is actuated, which contradicts the claimed limitation that the path be established after the switch is actuated. In response, the Examiner notes that "positioning a cursor within a groove" was not

asserted as constituting a switch, but instead, positioning a cursor within a region (i.e. a scroll bar) associated with a groove was asserted to constitute a switch. As described above in the discussion regarding claims 26, 27, and 30, Rosenberg clearly teaches establishing a device fundamental path (i.e. the groove) in response to positioning the cursor within such a region. Accordingly, for the reasons described above with respect to claims 26, 27, and 30, the Examiner maintains that Rosenberg teaches establishing the device fundamental path (i.e. groove) after actuating a switch (i.e. after moving the cursor within a region associated with the groove).

Lastly, the Examiner notes that even if positioning a cursor within a region associated with a groove did not entail a switch, Rosenberg explicitly teaches that the input device may comprise a "safety switch" used to active force feedback (for example, see column 13, lines 36-64). Accordingly, the device fundamental path (i.e. groove for model) associated with a scroll bar would be established in response to both moving the cursor within the scroll bar *and* activating the switch on the input device. In such circumstances, the motion initiation signal comprises a switch actuated by the user. The Appellant asserts that the suggestion that the device include a switch would eliminate the limitation the device path be established in part based on the position of a cursor. However, as the motion initiation signal comprises *both* moving the cursor to the scroll bar *and* activating the switch on the input device, the establishment of the device path is clearly based in part on the position of the cursor.

Accordingly, the Examiner maintains that Rosenberg anticipates claims 28 and 29.

B. Rejection of Claims 3, 5, 6, 35, and 36 under 35 U.S.C. 102(e) as anticipated by Stewart

B. Claim 3, argued separately

Regarding claim 3, the Appellant submits that Stewart teaches two modes of interaction with a virtual surface in an application: a first mode in which a path is defined for the user to move a haptic input device along, whereby an icon is constrained to the virtual surface; and a second mode in which the user can move the icon into the virtual surface and thereby change the virtual surface. As alluded to by the Appellant, the first mode teaches applying a force to the haptic input device responsive to a component of haptic input device motion not along the defined path (i.e. element "e" of claim 3), and the second mode teaches applying a force to the haptic input device responsive to interaction of the icon with the application (i.e. element "f" of claim 3). The Appellant, however, argues that these two modes of interaction are distinct and mutually exclusive, and thus apparently argues that Stewart fails to teach *both* elements e and f of claim 3, i.e. that Stewart fails to teach applying a force to the haptic input device responsive to a component of haptic input device motion not along the defined path, *and* applying a force to the haptic input device responsive to interaction of the object with the application. In response, the Examiner notes that there is no recitation or suggestion in claim 3 that these two forces are applied simultaneously. It is perfectly within the scope of claim 3, for example, for a force to be applied to the haptic input device responsive to a component of input device motion not along the defined path, and for some time later, a force to be applied to the haptic input device responsive to interaction of an associated object with the application. Stewart clearly teaches that the user may switch modes (for example, see column 7, lines 1-38). Accordingly, it is understood that the user may browse the surface via the haptic input device, whereby force is

applied to the haptic input device responsive to a component of input device motion not along the defined path, and then the user may switch modes, whereby force is applied to the haptic input device responsive to interaction of the icon with the application.

Further regarding claim 3, the Appellant argues that the rejection via Stewart requires that the object path (i.e. the virtual surface) also serve as the interaction with the application, which according to the Appellant, is in contrast to claim 3, which is limited to distinct object path and object interaction. In response, the Examiner notes that claim 3 does not explicitly recite distinct object path and object interaction, i.e. claim 3 does not explicitly recite that the force applied to the haptic input device responsive to a component of input device motion not along a defined path (i.e. element e) is distinct from the force applied to the haptic input device responsive to interaction of an associated object with an application (i.e. element f). Regardless, the Examiner submits that the object path force and the application interaction force within Stewart are distinct. As submitted by the Appellant, and described above, Stewart teaches two modes of interaction with a virtual surface in an application: a first mode in which a path (i.e. virtual surface) is defined for the user to move a haptic input device along, whereby an icon is constrained to the virtual surface; and a second mode in which the user can move the icon into the virtual surface and thereby change the virtual surface. Within the first mode, force is applied to the haptic input device responsive to a component of haptic input device motion not along the defined path (i.e. element "e" of claim 3), and in the second mode, force is applied to the haptic input device responsive to interaction of the object with the application (i.e. element "f" of claim 3). As submitted by the Appellant these two modes are distinct and mutually exclusive. Moreover, the force within the first mode is distinct from the force of the second mode; within

the first mode, the force is generated in response to moving the haptic input device *away* from the virtual surface, for example, whereas in the second mode the force is generated in response to moving the haptic input device *into* the virtual surface.

Accordingly, the Examiner maintains that Stewart anticipates claim 3.

B. Claim 5, argued separately

Regarding claim 5, the Appellant notes that this claim depends on claim 3, and argues that Stewart does not anticipate claim 5 for same reasons that Stewart does not anticipate claim 3. However, as asserted above, Stewart is considered by the Examiner to anticipate claim 3, and accordingly, the Examiner disagrees with this argument.

Further regarding claim 5, the Appellant submits that the rejection for this claim relies on the assertion that each edit to the virtual surface in Stewart corresponds to a different application state. The Appellant, however presents an analogous argument to that for claim 3, suggesting that the editing mode of Stewart (which anticipates element "f" of claim 3) is distinct from Stewart's browsing mode (which anticipates elements "d" and "e" of claim 3). The Appellant thus surmises that the different application states, each corresponding to a distinct virtual surface shape, are only in the editing mode conjecture. Accordingly, the Appellant argues that Stewart fails to teach different application states *and* elements d and e of claim 3 (i.e. an "object path"):

> *If, as the rejection requires, "editing of the surface" equates to "differing application states," then Stewart does not teach elements d and e of parent Claim 3, since there is no object path or forces contrary to motion off the object path in the editing mode, where user motion of the cursor **defines*** [sic] *the shape of the path. Stewart's teaching can be considered to have an object path, or an object that interacts with the application, but not both. Similarly, Stewart's teaching can be considered to have an object*

> *path, or infinite different states, but not both.* (Appeal Brief, page 20).

In response, the Examiner asserts that Stewart's teaching can in fact be considered to have both an object path and an object that interacts with the application. As asserted above in the discussion regarding claim 3, Stewart clearly teaches that the user may arbitrarily switch back and forth between the editing and browsing modes (for example, see figure 4A, and its associated description at column 7, lines 1-67). That is, in Stewart's teachings, the user may be in the browsing mode wherein the object path (i.e. the virtual surface) exists, and may then switch to the editing mode wherein object interaction exists (i.e. the user edits the virtual surface). By similar reasoning, Stewart's teaching is considered to have both an object path, and infinite different states. While in the editing mode, the user may arbitrarily edit the virtual surface (thus changing the application state), and then may switch to the browsing mode, whereby the user browses the object path, i.e. the edited virtual surface.

Accordingly, the Examiner maintains that Stewart anticipates claim 5.

B. Claim 6, argued separately

Regarding claim 6, the Appellant notes that this claim depends on claim 3, and argues that Stewart does not anticipate claim 6 for same reasons that Stewart does not anticipate claim 3. However, as asserted above, Stewart is considered by the Examiner to anticipate claim 3, and accordingly, the Examiner disagrees with this argument.

Further regarding claim 6, the Appellant presents an argument similar to that presented for claim 5 discussed above. That is, the Appellant argues that Stewart cannot teach *both* a device path (i.e. a surface corresponding to the virtual surface) and multiple states. As described

above in the discussion regarding claim 5, however, Stewart is in fact shown to teach both multiple states and a virtual surface. As suggested by the Appellant, the virtual surface has a corresponding device path. Stewart thus teaches both a device path and multiple states.

Accordingly, the Examiner maintains that Stewart anticipates claim 6.

B. Claims 35 and 36, argued together but separately from other claims under this ground of rejection

Regarding claims 35 and 36, the Appellant notes the similarity between each of these claims and claim 3 described above, and particularly notes that claims 3, 35, and 36 include similar object path and device path elements. The Appellant subsequently argues that Stewart does not anticipate claims 35 and 36 for same reasons that Stewart does not anticipate claim 3. However, as asserted above, Stewart is considered by the Examiner to anticipate claim 3, and accordingly, the Examiner disagrees with this argument.

Further regarding claims 35 and 36, the Appellant argues that Stewart has no teaching of interaction between simulated physical objects, as is claimed. The Appellant asserts that Stewart teaches a single motionless physical object (i.e. a virtual surface of a geometric model), but has no teaching of a second simulated physical object, and no teaching of this simulated physical object moving along a defined object path. In response, the Examiner submits that Stewart teaches such a second simulated physical object. Stewart explicitly discloses that a representation of the input device is displayed to the user, for example, via a computer screen (see figure 3, and column 5, lines 45-61). The user moves the input device in order to "sculpt" or browse the virtual surface of the geometric model, whereby it is understood that the computer

representation of the input device is accordingly displayed alongside the virtual surface (for example, see column 6, lines 19-38). Thus, Stewart provides a teaching of interaction between simulated physical objects, namely between a virtual surface of a geometric model and a representation of input device, whereby a simulated physical object (i.e. the representation of the input device) moves along a defined object path (i.e. the virtual surface).

Accordingly, the Examiner maintains that Stewart anticipates claims 35 and 36.

Rejections under 35 U.S.C. 103

C. Rejection of Claim 9 under 35 U.S.C. 103(a) as obvious in view of Rosenberg in combination with Frid-Nielson

Regarding claim 9, the Appellant asserts that Rosenberg does not teach or suggest all the elements of claim 3, upon which claim 9 depends, and argues that Frid-Nielson fails to teach the remaining elements. However, as asserted above, Rosenberg is considered by the Examiner to anticipate claim 3, and accordingly, the Examiner disagrees with this argument.

Further regarding 9, the Appellant argues that neither Rosenberg nor Frid-Nielson teaches or suggests changing the visual representation of an object based on the object's on-path or off-path condition, as is claimed. The Appellant, however, fails to provide any reasons as to why such a teaching is missing from Rosenberg and Frid-Nielson, and furthermore, fails to address the rejection for claim 9 presented in the previous Office Action and repeated above, which shows that Frid-Nielson in fact teaches changing the visual representation of an object (i.e. a cursor) based on its on-path or off-path motion (i.e. based on whether it is on or off a scroll bar).

As described in the previous Office Action and as repeated above, Frid-Nielsen explicitly discloses that the appearance of a cursor may be altered when it is placed on a scroll bar, the altered appearance indicating valid inputs of the user interface device (for example, see column 8, lines 29-48 of Frid-Nielson). Accordingly, the Examiner maintains that Rosenberg and Frid-Nielson teach changing the visual representation of an object based on the object's on-path or off-path condition.

Further regarding claim 9, the Appellant further submits that Frid-Nielson does not suggest any combination of its visual cursor display with force feedback, and that Rosenberg does not suggest combining its force feedback concepts with different visual cursor representation techniques. The Appellant thus concludes that there is no suggestion combine Rosenberg and Frid-Nielson, and that the proposed combination relies on impermissible hindsight. In response, the Examiner submits that such a disclosure, i.e. for combining different visual cursor displays with force feedback, is not necessarily a requirement for combining Rosenberg and Frid-Nielson. In Rosenberg, a graphical user interface is displayed in which a user may move a cursor (i.e. an "object") to a scroll bar (i.e. an "object fundamental path"), whereby it is understood that the user may supply one of various inputs with the input device in order to implement the scroll bar functionality (for example, see figure 21; and column 59, line 49 – column 60, line 23). Frid-Nielson similarly demonstrates this method for displaying a cursor as it is moved to a scroll bar, and explicitly points out a problem with this method, namely that there is no indication of what inputs the user may supply:

> Referring now to FIGS. 5A-B, the advantages of the intelligent screen cursor of the present invention will be illustrated. Both figures illustrate the interaction between a screen cursor and the scroll bar **217** of window **200**. In FIG. 5A, as the [prior art] screen cursor **225**

touches different components of the scroll bar **217**, <u>there is no indication or feedback to the user of what pointing device input(s), if any, are acceptable.</u> (Emphasis added, column 8, lines 29-36).

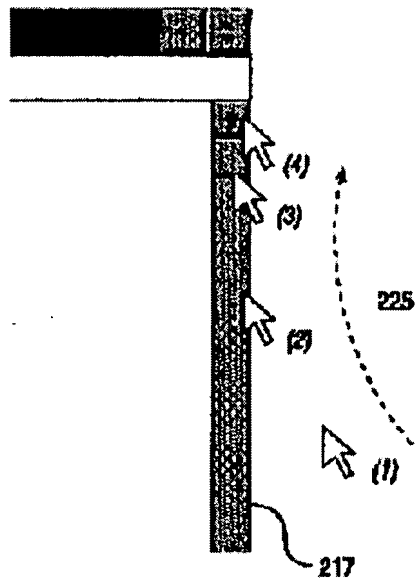

FIG. 5A

Frid-Nielson explicitly discloses that this problem may be avoided by using an "intelligent screen cursor," which visually changes as it is placed on the scroll bar in order to alert the user of valid inputs:

In FIG. 5B, in contrast, the intelligent screen cursor **275** indicates the valid inputs of the pointing device at all times. At position (1), for example, the cursor **275** displays the bitmap **280**, thus indicating only movement of the pointing device is available. At position (2), the cursor **275** is updated with the bitmap **281** to indicate that a left single click is a valid entry. At position (3), the cursor **275** is again updated, this time with the bitmap **286**, thus indicating valid pointing device input includes left click and drag operations. Finally, at position (4), the cursor **275** reverts back to the bitmap **281** to indicate to the user that a left single click is the only currently valid pointing

device input (other than movement). (Column 8, lines 36-48).

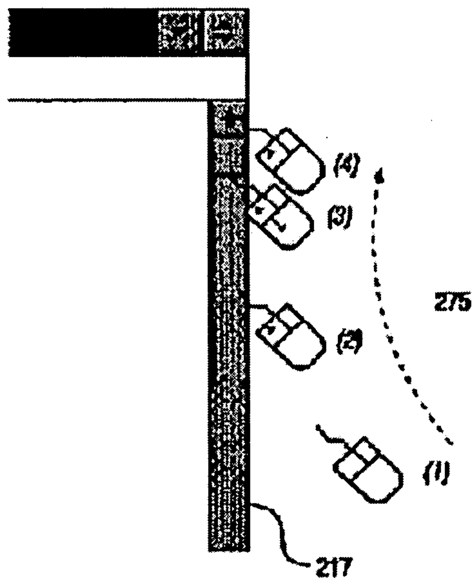

FIG. 5B

Frid-Nielson thus teaches visually modifying a cursor, such as the cursor of Rosenberg, when it is moved onto the scroll bar in so as to indicate to the user valid input commands. Frid-Nielson explicitly discloses that such an indication of valid input commands results in more intuitive software, which is highly desirable:

> The present invention recognizes that it is highly desirable to provide computers with system and application software which is highly intuitive to users, including those who are untrained in the use of the software. What is needed is a system and interface methods which require little or no knowledge of specific commands by the user. More particularly, the system should automatically and explicitly indicate to the user the appropriate action he or she may take. The present invention fulfills this and other needs. (Column 3, lines 31-40).

The Examiner therefore maintains that there is a suggestion, namely within Frid-Nielson, to modify the cursor of Frid-Nielsen, such that it changes its appearance when placed on a scroll

bar, or in other words, such that the cursor when the device is on the device fundamental path is perceptively different from the cursor when the device is not on the device fundamental path.

Accordingly, the Examiner maintains that the proposed combination of Rosenberg and Frid-Nielson establishes a prima facie case of obviousness for claim 9.

D. Rejection of Claim 10 under 35 U.S.C. 103(a) as obvious in view of Rosenberg in combination with Bertram

Regarding claim 10, the Appellant asserts that Rosenberg does not teach or suggest all the elements of claim 3, upon which claim 10 depends, and argues that Bertram fails to teach the remaining elements. However, as asserted above, Rosenberg is considered by the Examiner to anticipate claim 3, and accordingly, the Examiner disagrees with this argument.

Further regarding claim 10, the Appellant asserts that combining Rosenberg's grooved cursor guidance with multiple scrollbars, as taught by Bertram, would yield an interface with two scrollbars (i.e. two object fundamental paths), with a user allowed to move a single cursor (i.e. object) within one or the other. The Appellant thus argues that Rosenberg and Bertram fail to teach the elements of claim 10, which requires two objects: a first object moved in correspondence with a first object path, and a second object moved in correspondence with a second object path. In response, the Examiner asserts that a scroll bar thumb may also be considered an object, as is shown above in the discussion regarding claim 3, and in the rejection for claim 3 presented in the previous Office Action and repeated above. In such circumstances, the graphical user interface is considered to have two object paths (i.e. two scroll bars) and two

objects (i.e. two thumbs, one within each scroll bar). Accordingly, Rosenberg and Bertram in fact teach two objects, each with its own associated object path, as is expressed in claim 10.

Accordingly, the Examiner maintains that the proposed combination of Rosenberg and Bertram establishes a prima facie case of obviousness for claim 10.

<u>E. Rejection of Claims 14 and 25 under 35 U.S.C. 103(a) as obvious in view of Rosenberg in combination with Rosenberg II</u>

Regarding claims 14 and 25, the Appellant notes the similarity between each of these claims and claim 3 described above, and particularly notes that claims 3, 35, and 36 recite a similar path-based interface. The Appellant asserts that Rosenberg does not teach or suggest all the elements of claim 3, and argues that the combination of Rosenberg and Rosenberg II therefore fails to teach the elements of claims 14 and 25. However, as asserted above, Rosenberg is considered by the Examiner to anticipate claim 3, and accordingly, the Examiner disagrees with this argument.

Further regarding claim 14, the Appellant asserts that Rosenberg II teaches automatically moving a haptic input device to eliminate offsets between a display frame (i.e. what the user sees on a display) and a local frame (the frame of the haptic input device). The Appellant asserts that Rosenberg II recommends automatic movement of the haptic input device when the user is not grasping the input device, because such movement can be disconcerting to the user. Accordingly, the Appellants argue:

> *In contrast, the interface of Claim 14 is not disconcerting to the user: there is no need to decouple visual and haptic representations, since there is no underlying "frame" offset as in Rosenberg II, and the interface applies forces to urge to* [sic]

> *device to a display region, instead of moving the mouse to the center while not changing the visual display as in Rosenberg II.* (Appeal Brief, page 24).

In response, the Examiner notes that it is irrelevant as to whether or not the interface of claim 14 is disconcerting to the user, and it is irrelevant as to whether or not there is a need to decouple visual and haptic representations in claim 14. Whereas these may be differences between Rosenberg II and claim 14, such differences are not claimed. For example, claim 14 recites, in part:

> f) Applying a force to the haptic input device to urge the haptic input device to a starting region of the range of motion of the haptic input device, where the starting region comprises a region of the range of motion of the haptic input device such that motion of the haptic input device along the device fundamental path starting in the starting region will not require motion of the haptic input device outside its range of motion.

Accordingly, claim 14 requires applying a force to the input device to urge it to a particular region (i.e. a starting region) of its range of motion. There is no recitation that such a force is not disconcerting to the user, there is no recitation that such a force is not applied because of a frame offset between the input device and the display, and there is no recitation that there is no need to decouple visual and haptic representations. The Appellant argues that the interface of claim 14 applies forces to urge the input device to a specific region, whereas Rosenberg II teaches moving the mouse to the center while not changing the visual display. However, such an automatic movement of the mouse to the center, as done by Rosenberg II, necessarily requires applying

force to urge the mouse to the specified region (i.e. the center) of its range of motion. Thus Rosenberg clearly II teaches applying a force to the haptic input device to urge the haptic input device to a starting region of its range of motion.

Moreover, as an alternative to automatically moving the input device to a central position, Rosenberg II also teaches that if the input device is moved near an edge of its range of motion (i.e. within an "isometric region"), then a force is applied to the input device resisting any more movement towards the edge, and thus urging the input device away from the edge, towards a specific region (i.e. an "isotonic region") of the input device's range of motion (for example, see column 30, line 60 – column 32, line 43). Thus again, Rosenberg clearly II teaches applying a force to the haptic input device to urge the haptic input device to a starting region of its range of motion.

Further regarding claims 14 and 25, the Appellant submits that the interface of claim 14 determines a starting region based on the object path, and argues that there is no suggestion in Rosenberg II of any determination of a starting region based on an object path. In response, the Examiner submits that claim 14 does not recite or suggest any determination of a starting region based on an object path. Rather, as expressed above, claim 14 describes a starting region as comprising "a region of the range of motion of the haptic input device such that motion of the haptic input device along the device fundamental path starting in the starting region will not require motion of the haptic input device outside its range of motion." Rosenberg II is understood to teach such a starting region. For example, in the case where the input device is automatically moved to the center of its range of motion, the input device from this center would require movement of a significant distance for it to reach the edge of its range of motion.

Accordingly, motion of the haptic input device along the device fundamental path starting from this starting region (i.e. motion of the haptic input device to move a cursor along a scroll bar, beginning when the device is at the center of its range of movement) should generally not require motion of the haptic input device outside its range of motion. Such a central position is thus considered a starting region. As another example, Rosenberg II teaches that if the input device is moved near an edge of its range of motion (i.e. within an "isometric region"), then a force is applied to the input device resisting any more movement towards the edge, and thus urging the input device away from the edge, towards a starting region (i.e. an "isotonic region") of the input device's range of motion, as is asserted in the previous paragraph. Rosenberg II further teaches that, if the input device is near the edge (i.e. within the isometric region), then "isometric control" is implemented to move the cursor (see column 31, lines 44-67). With such isometric control, the cursor moves automatically at a rate and direction according to the distance the input device is positioned within the isometric region (see column 32, line 44 – column 33, line 7). A consequence of such isometric control is that the user may move the cursor to any position on the screen without having to move the input device outside its range of motion (for example, see column 33, lines 8-49). Accordingly, in such circumstances, a force is applied to the haptic input device to urge the device to a particular region (i.e. an "isotonic region") of the range of motion of the haptic input device, where this particular region clearly comprises a region of the range of motion of the haptic input device such that motion of the haptic input device along the device fundamental path starting in the particular region will not require motion of the haptic input device outside its range of motion. Rosenberg II thus teaches a starting region, like that claimed.

Accordingly, the Examiner maintains that the proposed combination of Rosenberg and Rosenberg II establishes a prima facie case of obviousness for claims 14 and 25.

F. Rejection of Claim 15 under 35 U.S.C. 103(a) as obvious in view of Rosenberg in combination with Gould

Regarding claim 15, the Appellant asserts that Rosenberg does not teach or suggest all the elements of claim 3, upon which claim 15 depends, and argues that Gould fails to teach the remaining elements. However, as asserted above, Rosenberg is considered by the Examiner to anticipate claim 3, and accordingly, the Examiner disagrees with this argument.

Further regarding claim 15, the Appellants assert that there is no suggestion to combine Rosenberg and Gould. The Applicants particularly assert that the proposed combination is improper because Gould teaches away from the combination, because the proposed combination renders Gould unsatisfactory for its intended purpose, and because the combination changes the principles of operation of the cited references.

In response to the argument that Gould teaches away from the combination, the Examiner asserts that, although Gould teaches using "virtual" force feedback and not actual force feedback like done by Rosenberg, this does not necessarily constitute a teaching away from the combination. One of ordinary skill in the art would not have been dissuaded from combining the force feedback of Rosenberg with the virtual force feedback of Gould. For example, at the time the invention was made, combinations of actual force feedback with virtual force feedback, e.g. "clipping," were known in the art (for example, see column 26, lines 9-41 of U.S. Patent No. 6,288,705 to Rosenberg et al.). Moreover, Gould clearly teaches that virtual force feedback may

improve a graphical user interface because, unlike actual force feedback, virtual force feedback reduces "background mechanical noise" (see column 2, lines 4-9; column 6, line 63 – column 7, line 3; column 1, lines 31-41). Such background mechanical reduces productivity (see column 2, lines 4-9; and column 1, lines 31-41 of Gould). The Examiner therefore maintains that one of ordinary skill in the art would have been motivated to combine Rosenberg and Gould.

In response to the argument that the proposed combination renders Gould unsatisfactory for its intended purpose, the Examiner asserts that such an argument is inappropriate, since Rosenberg is the primary reference that is modified via the combination. The combination does not render Rosenberg unsatisfactory for its intended purpose of allowing users to more accurately and efficiently perform cursor movement activities within a graphical user interface. The combination would not negatively affect this purpose. Even if Gould was the primary reference, the Examiner asserts that the combination does not render Gould unsatisfactory for its intended purpose of providing feedback to the user regarding display regions and of reducing background mechanical noise. The combination would not negatively affect this purpose. Accordingly, the Examiner maintains that that one of ordinary skill in the art would have been motivated to combine Rosenberg and Gould.

In response to the Appellant's argument that the combination changes the principles of operation of the cited references, the Examiner asserts that the proposed combination includes *both* virtual force feedback and actual force feedback, as is known in the art. Accordingly, since only virtual force feedback is being *added* to the actual force feedback of Rosenberg, and the actual force feedback is not substantially changed, the combination of references would not require a substantial reconstruction and redesign of the elements shown in Rosenberg or a change

in the basic principle under which Rosenberg was designed to operate. The Examiner therefore maintains that one of ordinary skill in the art would have been motivated to combine Rosenberg and Gould.

Accordingly, the Examiner maintains that there exists a suggestion to combine Rosenberg and Gould, and that this combination of Rosenberg and Rosenberg II establishes a prima facie case of obviousness for claim 15.

G. Rejection of Claims 16-18 under 35 U.S.C. 103(a) as obvious in view of Rosenberg, Gould, and Shih

Regarding claims 16-18, the Appellant asserts that Rosenberg and Gould does not teach or suggest all the elements of claim 15, upon which claims 16-18 depend, and argues that Shih fails to teach the remaining elements. However, as asserted above, the combination of Rosenberg and Gould is considered by the Examiner to teach all the elements of claim 15, and accordingly, the Examiner disagrees with this argument.

Further regarding claims 16-18, the Appellant argues that combining Rosenberg and Gould with Shih would destroy the utility of Shih for its intended purpose; the Appellant submits that for a sculpting application like that of Shih to function, the device path must have the same shape as the object path. In response, the Examiner points out that with the sculpting application of Shih, both the object to be sculpted (i.e. the "virtual object") and a representation of the input device (i.e. a "sculpting tool") are displayed to the user (for example, see column 9, line 50 – column 10, line 40). Thus, like demonstrated by Gould, the user would still accurately be able to move the representation of the input device to particular points on the display, simply by viewing

the display and noting the sculpting tool's relation to the virtual object (i.e. rather than relying *only* on force feedback to determine positions on the virtual object). Moreover, Shih even notes that there may be discrepancies the between movement of the input device and the movement of the corresponding displayed virtual tool. For example, whereas the virtual tool may be constrained to stay on or above the surface of the virtual object, the input device may not have such rigid constraints; force feedback may be applied to the input device resisting any attempt to penetrate the surface with the virtual tool, however, such movement of the input device is still allowed while the virtual tool remains displayed on the surface (for example, see column 8, line 48 – column 9, line 23). Therefore, combining Rosenberg and Gould with a sculpting application like that of Shih would still allow the sculpting application to function, and thus would not destroy the utility of Shih for its intended purpose.

Accordingly, the Examiner maintains that the proposed combination of Rosenberg, Gould, and Shih establishes a prima facie case of obviousness for claims 16-18.

H. Rejection of Claim 34 under 35 U.S.C. 103(a) as obvious in view of Rosenberg, Gould, and Rosenberg II

Regarding claim 34, the Appellant asserts that Rosenberg and Gould do not teach or suggest all the elements of claim 15, upon which claim 34 depends, and argues that Rosenberg II fails to teach the remaining elements. However, as asserted above, the combination of Rosenberg and Gould is considered by the Examiner to be properly combined and teach all the elements of claim 15, and accordingly, the Examiner disagrees with this argument.

Further regarding claim 34, the Appellant argues that the proposed combination would change the basic principle of operation and defeat the underlying purposes of each of the references. The Appellant asserts that the groove interaction in Rosenberg requires that the paths of the input device and the cursor have the same shape and a one-to-one correspondence, that the differently shaped paths of Gould are taught as an alternative to force feedback, and that the non-one-to-one correspondence in Rosenberg II is taught to accommodate motion that is not based on any object or device paths. In response to the assertion that Rosenberg requires paths that have the same shape and a one-to-one correspondence, the Examiner asserts that Rosenberg has no such requirement. Rosenberg clearly demonstrates that the motion of the cursor and the corresponding input device need not have a one-to-one correspondence (for example, see column 48, lines 56-67). Also, while the groove of Rosenberg is implemented to aid the user in moving a cursor along an object in the interface, such as a scrollbar, there is no explicit requirement that the motion of the input device and the motion of the cursor have the same shape. Gould clearly discloses that such motion need not have the same shape, as is described in the rejection for claim 15 presented in the Final Action and repeated above. In response to the Appellant's assertion that Gould teaches using virtual force feedback and not actual force feedback, the Examiner notes that combinations of actual force feedback with virtual force feedback were known in the art at the time the invention was made (for example, see column 26, lines 9-41 of U.S. Patent No. 6,288,705 to Rosenberg et al.; and see column 8, line 48 – column 9, line 23 of U.S. Patent No. 6,552,722 to Shih et al.). Accordingly, the Examiner maintains that it would have been obvious to not just use the virtual force feedback of Gould by itself, but to *combine* the virtual force feedback of Gould with the actual force feedback of Rosenberg. In response to

the Appellant's assertion that the non-one-to-one correspondence in Rosenberg II is taught to accommodate motion that is not based on any object or device paths, the Examiner asserts that the non-one-to-one correspondence (i.e. ballistics) in Rosenberg II may accommodate any input device motion, not just motion that is not based on any object or device paths (for example, see column 19, lines 4-31 of Rosenberg II). Accordingly, the Examiner maintains that the non-one-to-one correspondence in Rosenberg II applies to motion within the device paths. The proposed combination of Rosenberg and Gould with Rosenberg II, therefore, would not change the basic principle of operation and would not defeat the underlying purposes of each of the references.

With addition reference to claim 34, the Appellant asserts that the combination is made possible only with the use of claim 34 as a guide. In response, the Examiner notes that the cited references teach the specific elements of claim 34, and provide specific motivation for combining these specific elements, as is shown in the final rejection repeated above. The Examiner thus maintains that the combination is not made possible only with the use of claim 34 as a guide.

Accordingly, the Examiner maintains that the proposed combination of Rosenberg, Gould, and Rosenberg II establishes a prima facie case of obviousness for claim 34.

I. Rejection of Claim 32 under 35 U.S.C. 103(a) as obvious in view of Meredith and Rosenberg

Regarding claim 32, the Appellant asserts that Rosenberg does not teach or suggest all the elements of claim 3, upon which claim 32 depends, and argues that Meredith fails to teach

the remaining elements. However, as asserted above, Rosenberg is considered by the Examiner to anticipate claim 3, and accordingly, the Examiner disagrees with this argument.

Further regarding claim 32, the Appellant argues that the proposed combination of Meredith and Rosenberg would change the principle of operation of Meredith, and make it unsuitable for its intended purpose. In response, the Examiner first notes that the "pool simulation" and "pool cue" described in claim 32 essentially amount to non-functional descriptive material. Moreover, the Examiner asserts that adding the force feedback of Rosenberg to the pool cue input of Meredith would still allow the user to use a realistic pool cue, and move it with actual motions used in pool games (Rosenberg expressly teaches using a pool cue as a haptic input device; see column 13, line 65 – column 14, line 9). While force feedback may provide resistance in order to assist the user, the user would still be able to freely move the pool cue. Combining Rosenberg with Meredith, therefore, would not change the principle of operation of Meredith, and would not make it unsuitable for its intended purpose.

Accordingly, the Examiner maintains that the proposed combination of Meredith and Rosenberg establishes a prima facie case of obviousness for claim 32.

J. Rejection of Claims 31 and 38 under 35 U.S.C. 103(a) as obvious in view of Baynton, Rosenberg, and Meredith

J. Claim 31, argued separately

Regarding claim 31, the Appellant asserts that Rosenberg and Meredith do not teach or suggest all the elements of claim 3, upon which claim 31 depends, and argues that Baynton fails

to teach the remaining elements. However, as asserted above, Rosenberg is considered by the Examiner to anticipate claim 3, and accordingly, the Examiner disagrees with this argument.

Further regarding claim 31, the Appellant argues that there is no way to produce the combination required for the rejection, since there is no teaching of deriving input to a computer from the motion of the golf club of Baynton; the Appellant asserts that there is no teaching of golf club input to a computer, there is no teaching of force feedback to a golf club, and there is no teaching of interaction of a simulated golf club with other objects. In response, the Examiner first notes that the "golf simulation" and "golf club" described in claim 32 essentially amount to non-functional descriptive material. Moreover, the Examiner asserts that Rosenberg teaches haptic input device input to a computer, wherein the haptic input device is a pool cue and whereby force feedback is provided to the pool cue, as described in the rejection, which is repeated above. Meredith further teaches interaction of a simulated pool cue with other objects, as described in the rejection, which is repeated above. Baynton demonstrates that, like pool, golf is another well known and popular activity. The Examiner thus maintains that it would have been obvious to create a simulation like the pool simulation of Rosenberg and Meredith, but with golf instead. Therefore, as Meredith and Rosenberg teach applying pool cue input to a computer, applying force feedback to the pool cue; and providing interaction of a simulated pool cue club with other objects, the combination of Baynton, Meredith, and Rosenberg, similarly teaches applying golf club input to a computer, applying force feedback to the golf club; and providing interaction of a simulated golf club with other objects.

Accordingly, the Examiner maintains that the proposed combination of Baynton, Meredith, and Rosenberg establishes a prima facie case of obviousness for claim 31.

J. Claim 38, argued separately

Regarding claim 38, the Appellant notes that this claim depends on claim 31, and argues that Baynton, Rosenberg, and Meredith do not teach the elements of claim 38 for the same reasons that Baynton, Rosenberg, and Meredith do not teach the elements of claim 31. However, as asserted above, Baynton, Rosenberg, and Meredith are considered to teach the elements of claim 31, and accordingly, the Examiner disagrees with this argument.

Further regarding claim 38, the Appellant asserts that there is no teaching of differently shaped object and device paths in any of the references, and assert that Baynton cannot be modified to have such differently shaped object and device paths. In response, the Examiner asserts that Rosenberg teaches such differently shaped object and device paths. For example, Rosenberg discloses that there may be discrepancies between motion of the displayed object and motion of the input device (see column 48, lines 56-67). The paths associated with such object and input device movement may thus be differently shaped. As Rosenberg and Meredith teach modifying Baynton to include an object path in addition to a device path, as is suggested in the discussion concerning claim 31, it is understood that such paths may be differently shaped.

Accordingly, the Examiner maintains that the proposed combination of Baynton, Meredith, and Rosenberg establishes a prima facie case of obviousness for claim 38.

K. Rejection of Claim 37 under 35 U.S.C. 103(a) as obvious in view of Stewart and Rosenberg II

Regarding claim 37, the Appellant asserts that Stewart does not teach or suggest all the elements of claim 35, upon which claim 37 depends, and argues that Rosenberg II fails to teach the remaining elements. However, as asserted above, Stewart is considered by the Examiner to anticipate claim 35, and accordingly, the Examiner disagrees with this argument.

Further regarding claim 37, the Appellant argues that the safety switch of Rosenberg turns off all haptic interaction, whereas the signal in claim 37 only turns off path-based motion. In response, the Examiner asserts that Rosenberg II, as combined with Stewart, nevertheless reads on the limitations of claim 37. For example, as described in the rejection repeated above, Rosenberg II discloses that force feedback may only be applied in response to detecting a safety switch activated by the user (see column 17, lines 46-67). Thus as applied to Stewart, Rosenberg II teaches: accepting a signal from the user (e.g. the user activates the safety switch), which indicates that a "path interaction" (i.e. force feedback responsive to device input, including input relative to a defined path) is desired, and when the signal is accepted, then moving the object according to d) and e) of claim 35; and accepting a signal (e.g. deactivation of the safety switch) from the user indicating that such path interaction is not desired, and, when the signal is accepted, then moving the cursor in the computer presentation corresponding to motion of the haptic input device, but without force feedback.

Accordingly, the Examiner maintains that the proposed combination of Stewart and Rosenberg II establishes a prima facie case of obviousness for claim 37.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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May 7, 2007

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